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The Mediating and Moderating Relationship Between Cultural Intelligence Dimensions

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Abstract

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MA, Walden University, 2011

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Dissertation Submitted in Partial Fulfillment

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Abstract

Lack of knowledge sharing has led to increased deaths during the pandemic as well as cooperate revenue losses in the billions. Cultural intelligence (CQ) increases knowledge sharing because the creation of laws, public and corporate policies, and personal biases are founded in culture. To raise CQ in the real-world, developers of training programs need information regarding how the construct develops. The purpose of this study was to provide more information regarding the development of CQ, specifically testing higher-order and indirect relations between cognitive and behavioral CQ. A sample of 225 SurveyMonkey audience members completed the surveys. The results showed that (a) simple mediation was significant with motivational CQ and metacognitive CQ acting singly as mediators, (b) serial mediation was significant through motivational CQ followed by metacognitive CQ and through metacognitive CQ followed by motivational CQ, (c), parallel mediation was significant along the same paths, and (d) no moderation paths were significant. These findings show that there were four causal chains in the development of CQ. All the mediation paths from cognitive to behavioral CQ included either metacognitive CQ, motivational CQ, or both; this knowledge can be used by developers of CQ training to create new test models with the goal of creating long-lasting CQ in the real world and creating positive social change.

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Dedication

I dedicate my dissertation to my husband Chad Musick in appreciation for the countless hours of discussion and support. I would like to also thank Chad for always believing me. Chad also knew when to pushing me and when to encouraging me to take time off for self-care.

Acknowledgements

I first met my chair, Prof. Amy Sickel, during my first residency. I have been fortunate enough to have her guidance since the inception of my research topic. Prof. Sickel has been instrumental in the refinement of my research questions and my ability to hone my scholarly thinking. Prof. Sickel's style of mentorship allowed me to explore my topic while continuing to reach dissertation milestones in a timely manner. I am forever grateful for her support and belief in me.

Prof. Diebold was an amazing methodologist. The depth and breadth of his knowledge allowed me to feel confident in my methodology. Prof. Diebold's guidance ensured that my writing and methodology was elevated and modern. I would not have been able to complete my dissertation with its current level of clarity and scholarly voice without his guidance and support.

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Chapter 1: Introduction to the Study

Globalization in conjunction with the COVID pandemic has highlighted the importance of knowledge sharing across cultures and borders (de Castro et al., 2020; Kwantes & Glazer, 2017). Failure to knowledge-share during the COVID pandemic cost lives because necessary information about diagnosis, mutation of the virus, necessary personal protection for health care workers, and information for the best preventive measures to slow transmission was not quickly communicated across borders (Jecker et al., 2021). This lag in communication hampered the ability to create an early unified global response, resulted in multiple waves of infection, and increased death rates that were later exacerbated by the uneven distribution of vaccines (Golestaneh et al., 2020; Jecker et al., 2021; Nathavitharana et al., 2020).

In addition to leading to increased death rates, failure to knowledge-share across cultures also leads to corporate revenue losses estimated at $31.6 billion annually globally and at $2 billion annually for the United States (Jecker et al., 2021; Kwantes & Glazer, 2017; Vlajčić et al., 2019). The pandemic demonstrated how connected the global economy is because as countries closed their borders and reduced knowledge-sharing, the world experienced an economic downturn worse than any since World War II (de Castro et al., 2020). In nearly all cases, failure to knowledge-share in business, medical, and personal dynamics is due to low cultural intelligence (Hani et al., 2020; Roux & Suzuki, 2017; Stoermer et al., 2021; Young et al., 2017a). This is because global policies and laws are culture-based, as are biases and preferences (Nath, 2020; Roux & Suzuki, 2017).

Cultural intelligence (CQ) is the ability to understand and navigate cultural constructs different from those in one's own culture (Van Dyne et al., 2015). Earley and Ang (2003) defined the three-dimension CQ construct consisting of cognitive/metacognitive, motivational, and behavioral dimensions. Ang et al. (2007) quantitively validated Earley and Ang's theoretical model and separated cognitive/metacognitive CQ into cognitive CQ and metacognitive CQ, resulting in a four-dimensional (cognitive, metacognitive, motivational, and behavioral) construct. In the same research, they developed and validated the psychometric measurement of CQ by the Cultural Intelligence Scale (CQS). Both Ang et al. (2007) and Van Dyne et al. (2015) validated a four-dimension model and the 20-item CQS; this is discussed in the background section and detailed in the development of CQ and psychometrics section. I used Van Dyne's et al.'s (2015) version of the CQS in my research. My work is grounded in Earley and Ang's (2003) CQ theory and in multiple intelligences theory, as described in the theoretical section.

I further detail research on CQ theory in the background section of this chapter. In the background section, I also discuss CQ antecedents, simple relations between the dimensions, mediation and moderation of the dimensions, and the meditating and moderating effect of the dimensions on the relations between phenomena, which have all been studied (see Gooden et al., 2017; Fang et al., 2018What is missing from the current body of CQ research is an in-depth understanding of the interrelations among the dimensions (Rockstuhl & Van Dyne, 2018).Discussed more fully in my problem statement is how my research addressed this gap by examining whether mediation, moderation, serial mediation, parallel mediation, and moderated moderation occur

between the dimensions (Hayes, 2018; Ott & Michailova, 2018;). In the purpose section, I detail how my research addressed the need for deeper exploration of what promotes and inhibits CQ development to contribute knowledge that will, among other things, improve researchers' ability to design universal training that can create real-world effects across settings and populations (Azevedo & Shane, 2019; Shepherd, 2019). In addition to the purpose section, I have also included a section focused on defining central themes and terms used throughout this work. I have included a discussion of the major assumptions of my research and the scope of my research. My research was limited by my population comprising exclusively SurveyMonkey audience members and my inability to test all possible interrelations among dimensions (Hayes, 2018). My quantitative research is significant because it demonstrates that there are indirect interactions between the factors, which allows future researchers to examine how this influences the development of CQ and, in turn, how best to develop training (Azevedo & Shane, 2019; Rockstuhl & Van Dyne, 2018; Shepherd, 2019).

Background

In 2007, Ang et al. validated the four-dimension structure of CQ (cognitive, metacognitive, motivational, and behavioral) and developed and validated the psychometric measurement of CQ via the CQS. The four-dimension model and the CQS has been validated for use in eight countries: the United States (Ang et al., 2007; Van Dyne et al., 2015), Singapore (Ang et al., 2007; Van Dyne et al., 2015), Turkey (Şahin et al., 2013), Spain (Moyano et al., 2015), Ireland (Shannon & Begley, 2015), Saudi Arabia (AL-Dossary, 2016), Poland (Barzykowski et al., 2019), and India (Ruparel et al., 2020).

I used the CQS in my research because it is the most widely used measurement of CQ (Fang et al., 2018). Ang et al. not only validated the CQS but also called for research into antecedents of CQ, and a plethora of researchers have contributed to filling this gap (e.g., Adair et al., 2016; Alexandra et al., 2021; Ang et al., 2006; Fang et al., 2018; Lin & Shen, 2019).

In addition to antecedents, researchers have investigated CQ's mediating and moderating effects on relations between phenomena and CQ's effects on phenomena (Fang et al., 2018). Research into the interrelations between CQ's effects is lacking, with one research team at the time of this writing having focused on the interrelations and found simple relations between the dimensions (Gooden et al., 2017). In my research, I built on Gooden et al. (2017) and investigated mediation, moderation, serial mediation, parallel mediation, and moderated moderation among the four dimensions of CQ. Examination of more complex interrelations existing between dimensions advances the development of the CQ nomological network and provides those developing training more information on how and when CQ develops (Azevedo & Shane, 2019; Rockstuhl & Van Dyne, 2018; Shepherd, 2019).

Problem Statement

Currently, there is a need for CQ training that leads to long-lasting changes in the real world across settings and populations because the increased CQ reduces stereotyping and promotes trust, creativity, well-being, knowledge sharing, and life satisfaction (Azevedo & Shane, 2019; Gebregergis, 2019; Mangla, 2021; Mehra & Tung, 2017; Shepherd, 2019). Having more information about how CQ develops allows researchers to

use this knowledge to test new training methods focused on producing CQ in the real world, as well as across settings and populations, via increased knowledge of how and when CQ develops (Azevedo & Shane, 2019; Shepherd, 2019). I investigated mediation, moderation, serial mediation, parallel mediation, and moderated moderation between dimensions of CQ. Mediation explains how CQ develops; serial mediation explains whether the dimensions develop sequentially; parallel mediation in my model reveals whether the construct can develop down paths that are not sequential; moderation explains under what circumstances an effect occurs; and moderated moderation demonstrates whether moderators behave differently in combination (Hayes, 2018). My findings are discussed more fully in Chapters 4 and 5.

Purpose Statement

The need for more information regarding what, when, and how CQ effects occur has been intensified by increased globalization, which has led to more cultural diversity in schools, society, and workplaces, highlighting the need to understand why some people thrive in multicultural settings and others do not (Ang et al., 2007; Azevedo & Shane, 2019). The COVID-19 pandemic made the need to knowledge-share across cultures a matter of life and death (Jecker et al., 2021). Failure to knowledge-share during the pandemic hampered a unified global response, and the cost of life was exacerbated by the uneven distribution of vaccines, which led to higher death rates among the most disadvantaged (Golestaneh et al., 2020; Nathavitharana et al., 2020)In nearly all cases, failure to knowledge-share across cultures and borders at the business, medical, and

interpersonal levels is due to a lack of CQ (Stoermer et al., 2021; Hani et al., 2020; Roux & Suzuki, 2017; Young et al., 2017a).

Better understanding of the relations among CQ dimensions provides a deeper understanding of the capabilities intrinsic to the individual dimensions and clarifies the conditions that develop CQ and create specific effects (Gooden, 2017; Ott & Michailova, 2018). I addressed the need for more information regarding what, when, and how CQ effects occur (Azevedo & Shane, 2019; Rockstuhl & Van Dyne, 2018; Shepherd, 2019). Using the four-dimension model of CQ (cognitive, metacognitive, motivational, and behavioral) validated by Van Dyne et al. (2015), I filled a gap in the literature by examining complex relations among the four dimensions of CQ (Gooden et al., 2017; Racicot & Ferry, 2016). My research questions allowed me to provide empirical evidence for relations between CQ dimensions that had previously been theoretical (Ang et al., 2007; Racicot & Ferry, 2016; Rockstul & Van Dyne, 2018).

Research Questions and Hypotheses

Mediation Research Questions

Research Question One: Path $a_1d_{12}b_2$ (see Figure A1): To what extent does metacognitive CQ mediate the mediation of cognitive CQ's effect on behavioral CQ by motivational CQ?

Research Question Two: Path $a_2d_{21}b_1$ (see Figure A2): To what extent does motivational CQ mediate the mediation of cognitive CQ's effect on behavioral CQ by metacognitive CQ?

Research Question Three: Path $a_1b_1a_2b_2$ (see Figure A3): To what extent do motivational CQ and metacognitive CQ, while controlling for each other, mediate the effect of cognitive CQ on behavioral CQ?

Research Question Four: Path a_1b_1 (see Figure A4): To what extent does metacognitive CQ mediate the relation between cognitive CQ and behavioral CQ?

Research Question Five: Path a_2b_2 (see Figure A5): To what extent does motivational CQ mediate the relation between cognitive CQ and behavioral CQ?

Moderation Research Questions

Research Question Six (see Figure A6): To what extent does motivational CQ moderate the moderation of cognitive CQ's effect on behavioral CQ by metacognitive CQ?

Research Question Seven (see Figure A7): To what extent does metacognitive CQ moderate the relation between cognitive CQ and behavioral CQ?

Research Question Eight (see Figure A8): To what extent does motivational CQ moderate the relation between cognitive CQ and behavioral CQ?

Research Question Nine (see Figure A9): To what extent does motivational CQ moderate the relation between metacognitive CQ and behavioral CQ?

Theoretical Framework

Earley and Ang (2003) drew from Thorndike's (1920) multiple intelligences theory in their theoretical development of CQ. Thorndike introduced the concept of autonomous forms of intelligence, such as social intelligence, that are not traditionally found in the classroom (Putranto et al., 2018). Thorndike's inclusion of social interaction

as a form of intelligence created the foundation for CQ theory, which relies on the observation that the ability to interpret cultural cues in and out of the social arena and then adapt one's behaviors according to that interpretation is a form of intelligence (Earley & Ang, 2003).

Earley and Ang also grounded CQ theory in Gardner's (2013) theory of multiple intelligences, developed in 1983 (Ang et al., 2007). Gardner laid the groundwork for understanding culture as a form of intelligence by including the proposition that behaviors and performance skills reflect types of intelligence (Earley & Ang, 2003; Gardner, 2013). In Gardner's multiple intelligences theory, autonomous forms of intelligence impact behavior and phenomena independently and via interaction. Earley and Ang further argued that people's ability to understand and adapt to cultures other than their own is driven by three autonomous but interacting types of intelligence: cognitive/metacognitive CQ, motivational CQ, and behavioral CQ. Ang et al. (2007) refined Earley and Ang's three dimensions model by quantitatively demonstrating cognitive and metacognitive CQ were two distinct and separate dimensions. Ang et al. developed the CQS as a measure of CQ.

Like Ang et al. (2007), I drew from Thorndike's (1920) and Gardner's (2013) theories of multiple intelligences. I used the CQS developed by Ang et al. and validated by Van Dyne et al. (2015). Using the CQS, I built on Earley and Ang's work because further development of the CQ nomological network is the next step in creating a more refined understanding of CQ theory (Rockstuhl & Van Dyne, 2018). I explored which simple and higher-order relations (mediation, moderation, serial mediation, parallel

mediation, or moderated moderation relations), if any, existed among the four CQ dimensions, providing insights into the structure and interactions among dimensions (Hayes & Rockwood, 2017). My quantitative exploration into the relations between the four autonomous but interacting dimensions of CQ expanded multiple intelligences theory by adding to the literature on autonomous intelligence domains and their interactions (Gardner, 2013; Thorndike, 1920).

Nature of the Study

In this quantitative study, I explored the interrelations among the four CQ dimensions (cognitive, metacognitive, motivational, and behavioral) using the CQS. The CQS is a psychometric questionnaire validated by Van Dyne et al. (2015) to measure the individual dimensions of CQ. The CQS is written in English and is a self-report measure of CQ. The CQS has 20 items and has a four-dimension structure, with each of the dimensions representing a unique intelligence domain (four items for metacognitive CQ; six items for cognitive CQ; five items for motivational CQ; and five items for behavioral CQ). The CQS has been verified cross-culturally (Ott & Michailova, 2018). All answers are given on a 5-point Likert scale ranging from *strongly agree* to *strongly disagree.* I used the SurveyMonkey platform to deliver the CQS to SurveyMonkey audience members, who were 18 years or older, identified as English speakers, had access to the platform, and lived in the United States at the time of participation.

I used Hayes's (2018) PROCESS addon for IBM's SPSS software (Hayes PROCESS) to check for moderation, mediation, serial meditation, parallel mediation, and

moderated moderation along the path from cognitive to behavioral CQ via metacognitive and motivational CQ, as well as moderation in the pathway from metacognitive CQ to behavioral CQ via motivational CQ, to answer my research questions. I collaborated with Dr. Diebold to determine the adequate number of responses, 224. I used multiple regression, goodness-of-fit testing, and other quantitative techniques as necessary to validate the data and check for internal consistency. I used Hayes's PROCESS because of its ability to test for single mediators and moderators (simple relations) and multiple mediators and moderators (higher-order relations). In my research, I tested the simple relations of mediation and moderation as well as higher-order relations with multiple mediators and moderators, such as serial mediation, parallel mediation, and moderated moderation, among the four dimensions of CQ.

Definitions

Behavioral cultural intelligence (CQ): The ability to adapt verbal and physical behaviors to fit the culture of context, including facial movements, voice inflections and tone and verbal and physical indicators of emotional states.

Cognitive cultural intelligence (CQ): The knowledge about other cultures necessary to create complex cultural schemas (Ang et al., 2007), which are the knowledge individuals have about a specific culture or cultures that go beyond stereotypes by having complexity sufficient to create mental representations of different cultural groups' social interactions, laws, and traditions (Triandis, 1994).

Cultural intelligence (CQ): A type of multiple intelligence (Earley & Ang, 2003). CQ is the capability to move past stereotypes, process cultural information,

persevere in culturally difficult situations, and produce verbal and nonverbal behaviors that will be viewed as intelligent in the culture of context (Ang et al., 20017). Ang et al. (2007) defined CQ as a four-dimensional construct, though Rockstuhl and Van Dyne (2018) argued that CQ may be better understood as a bi-factor model. Rockstuhl and Van Dyne stated that each of the four dimensions is as distinct as an overall, latent CQ. Additionally, Rockstuhl and Van Dyne explained that the overlap between the dimensions (their shared variance) creates the fifth and unique dimension of latent (or general) CQ. I used the term *latent CQ* when discussing the shared variance and overlap between the dimensions.

Cultural stereotypes: False beliefs or overgeneralizations about groups of people based on one or more cultural attribute, such as religion or language spoken (Garcia, 2018). Each of the four dimensions of CQ is a unique capability and type of intelligence (Van Dyne et al., 2015).

Culture: Created by an individual's interpretation of power dynamics and structures in education, work, and organizational settings; and their intersection with identity constructs such as, ethnicity, nationality, religion, class, gender, values, traditions, language, lifestyle, family, personality, society, friends, disability, sexual orientation, sexual practices, education, and perception of race (Roux & Suzuki, 2017; Young et al., 2017a).

Metacognitive cultural intelligence (CQ): The ability to be aware of and adjust to cultural schemas as well as process information in a manner that promotes understanding

of cultures different than one's own; it allows for connections to be created across cultures, between individuals, and within groups (Ang et al., 2007).

Motivational cultural intelligence (CQ): The ability to create the drive to gather and process information as well as the desire to develop the ability to display cultural knowledge via a set of habits or practices. Motivational CQ results in sustaining these drives even when the processes to do so becomes challenging (Ang et al., 2007).

Race and ethnicity: Gracia (2018) stated that race and ethnicity are both social constructs. Garcia explained the categorization of groups of people into putatively homogenous groups by ethnicity ignores distinct and different cultural subgroups. Garcia continued, stating that within-group differences are vast and personal and that denial of these difference creates the perception that these classifications are meaningful. Garcia further argued that such beliefs contribute to negative stereotyping of those not from the dominant group. Having CQ provides individuals the skills to deconstruct generalities (stereotypes) based on group membership (Earley & Ang, 2003). Race is a concept born of a colonial need to classify groups that came from different regions of the world and inherent in the creation of implicit (unknown) and explicit (known) biases (Lowe, 2010).

Assumptions

In my research, I studied the interactions between CQ dimensions, with the goal of expanding the CQ nomological network; however, there are some necessary assumptions (Hayes, 2018). I assumed that because participants self-selected to participate in my study, their motivation was to answer the questionnaire truthfully and that they did not intend to manipulate the results with deceptive answers. This assumption

is supported because I did not use an emotional appeal, which reduces emotional reactivity, and improves honesty (Hayes, 2018). I also assumed that my research would fill a gap in the literature by testing the interrelations of the CQ dimensions. This assumption is supported by the literature (Racicot & Ferry, 2016; Rockstuhl & Van Dyne, 2015). In further support of this assumption is Gooden et al. (2017), who found evidence of the dimensions' interactions. I did not investigate all possible interactions, which leaves room for compelling arguments that other interactions exist. I explore this more fully in the next section.

Scope and Delimitations

I tested five types of interrelations among the four dimensions of CQ: mediation, moderation, serial mediation, parallel mediation, and moderated moderation. My purpose for testing these relations was to determine whether CQ's dimensions impact the development of other dimensions and/or influence each other, aiming to clarify what, when, and how CQ effects occur (Hayes, 2018). This can improve training outcomes by improving information available to managers, researchers, and developers of training (Ott & Michailova, 2018). Because CQ is globally important, I focused on providing insights into the interrelations of CQ (Ang et al., 2007).

Data used were collected via the SurveyMonkey platform. I limited participants to adults 18 years or older because the CQS was designed for use with adults (Van Dyne et al., 2015). Although researchers have translated the CQS into languages other than English, I am only able to read English and therefore limited participants to the English version of the CQS; I further limited my participant pool to those who identify as English

speakers. I limited the participants to those living in the United States with a diploma from an accredited 4-year high school to exclude those who were homeschooled because traditionally educated students have, on average, higher reading comprehension than their homeschooled counterparts and those who did not graduate from an accredited high school (Guterman & Neuman, 2019). This limited artifactual results arising from poor reading comprehension and improves confidence in my results. Online survey services such as SurveyMonkey have access to more people as well as greater geographic and demographic diversity than available via in-person sampling, and this greater access enhances generalizability and improves confidence in my findings (Rice et al., 2017). I studied only five of the possible interrelations between the four dimensions of CQ (as operationalized by the CQS) because, as discussed in Hayes (2018), it is not possible to test all the relations between phenomena.

I analyzed the data using Hayes's (2018) PROCESS plugin for IBM's SPSS to test for mediation, moderation, serial mediation, parallel mediation, and moderated moderation. The input data were the answers to the CQS, and I administered the survey via the SurveyMonkey platform. I excluded surveys with incomplete answers from the data. Hayes's PROCESS uses ordinary-least-squares regression to estimate variables. I also used Hayes's PROCESS on segments of the paths to apply regression testing, with overall effects characterized by using Monte Carlo bootstrapping to estimate confidence intervals. I tested mediation effects by considering the relations between the input and output variables. I checked simple moderation by examining how strongly the moderating variable affects the slope and direction of the correlation between the input and output

variables. To test the higher-order relations of serial mediation, parallel mediation, and moderated moderation, I used Hayes's PROCESS with bootstrapping to produce confidence intervals.

Limitations

In my research, I did not look beyond the relations among dimensions despite a need to understand the mediating and moderating effects of CQ on phenomena not related to the construct (Ott & Michailova, 2018). This was because there is already extensive research on CQ's mediating and moderating relations with other phenomena; in contrast, research into the relations between dimensions is still nascent (Fang et al., 2018; Gooden et al., 2017). I did not test for all possible interrelations between the factors because, as noted by Hayes (2018), no researcher can test all possible relations in a construct. I conducted my research via the internet although, as noted in Fang et al.'s (2018) literature review, most CQ research is conducted in person because most CQ researchers work at a university and test their students or have corporate connections and test workers.

Due to time and financial constraints as well as a lack of university and corporate connections, I conducted my research online via the SurveyMonkey platform. I live in an area of Japan with limited English-speaking social contacts, which would have made it difficult to find participants in person. Additionally, it would have been quite expensive for me to travel to a country or area with a larger English-speaking population. Using the SurveyMonkey platform, I lowered the cost and time necessary to distribute and collect surveys without limiting generalizability because of the diversity in individuals enrolled

in their service (Rice et al., 2017). In my suggestions for future research, I include the suggestions that researchers explore relations beyond my study and include populations not included in my research.

Significance

The majority of CQ researchers have focused on the construct's relations with other phenomena rather than the interrelations between the dimensions (Fang et al., 2018). I contributed to filling a gap in the literature by studying the interrelations among the dimensions and contributed to the development of the construct's nomological network while also refining the knowledge regarding what, when, and how effects are caused and created (Hayes, 2018; Racicot & Ferry, 2016; Rockstuhl & Van Dyne, 2018; Sharma, 2019). I thus contributed knowledge necessary to develop CQ training that raises all four dimensions of CQ consistently (Ott & Michailova, 2018). Currently, most corporate CQ training programs are short courses focused on raising cognitive, metacognitive, and behavioral CQ with the aim of improving knowledge-sharing across cultures, the ability to work on multinational teams, and the completion of international work assignments (Fang et al., 2018). The COVID-19 pandemic created a deeper understanding of the need for CQ training beyond universities and corporations because of the loss of lives caused by a failure to knowledge-share across borders regarding diagnosis, mutation of the virus, necessary personal protection for health care workers, information for the best preventive measures to slow the spreading of virus preventing mutations, and uneven distribution of vaccines (Golestaneh et al., 2020; Jecker et al., 2021; Nathavitharana et al., 2020). My elucidation of the relations among the dimensions

of CQ will improve the ability to develop interventions that target specific CQ dimensions to best reduce prejudice, deepen life satisfaction, build trust, grow creativity, and enhance well-being (Ang et al., 2007). Additionally, I provided information that will improve knowledge-sharing across cultures, while working on multinational teams, completing international work assignments, and in the medical arena by adding to the knowledge of how CQ effects are created and developed (Fang et al., 2018; Gebregergis et al., 2019; Rockstuhl & Van Dyne, 2018). I accomplished all of this by making my findings of how and when CQ developers openly available to mangers, teachers, individuals, and developers of CQ research on the SurveyMonkey website.

Summary

Failure to knowledge-share during the COVID pandemic resulted in lost lives and contributed to the greatest economic downturn since WWII (de Castro et al., 2020; Jecker et al., 2021). CQ improves knowledge-sharing across cultures in business, medical, and personal situations (Hani et al., 2020; Roux & Suzuki, 2017; Stoermer et al., 2021; Young et al., 2017a). CQ also reduces prejudice, deepens life satisfaction, builds trust, promotes creativity, and enhances well-being (Earley & Ang, 2003). By adding to the knowledge of how CQ effects are created, I provided information on how CQ develops and improved the ability to develop training that will improve knowledge-sharing across cultures, working on multinational teams, and completing international work assignments (Fang et al., 2018; Gebregergis et al., 2019; Rockstuhl & Van Dyne, 2018). Further, by researching mediation, moderation, serial mediation, parallel mediation, and moderated moderation for the purpose of defining when, where, and how CQ's effects are promoted

and occur, I filled a gap in the literature (Gooden et al., 2017; Hayes, 2018; Ott & Michailova, 2018). Elucidating the relations among the dimensions of CQ, I built on Earley's (2002) goal of improving researchers' ability to develop interventions that target the development of specific dimensions and improve knowledge-sharing, especially in times of crisis, improve everyday life, and reduce corporate losses via the development of CQ training that creates long-lasting real-world results.

Chapter 2: Literature Review

Ang et al. (2007), after validating the four-dimension model for CQ (cognitive, metacognitive, motivational, and behavioral), advocated for the development of CQ training to improve individual's ability to function in multicultural settings. One approach to training development has been to study antecedents of CQ, such as the BIG 5 personality traits (Ott & Michailova, 2018). CQ training, whether developed via the study of antecedents or focused on technique, has the goal of enhancing the direct effects of CQ (Ang et al., 2007). The most globally impactful direct effect of raising CQ is the reduction of stereotypes (Earley & Ang, 2003). Stereotypes are assumptions about a person or group of people that allow for the justification of dehumanization, resulting in the implementation of discriminatory and exploitative practices (Pawlicka et al., 2019). Stereotypes led to increased death rates among Black, Asian, Middle Eastern, and Hispanic populations during the global pandemic via lower prioritization for interventions and vaccination (Jecker et al., 2021). CQ's direct effects have global implications, as do its indirect effects. For example, all four dimensions of CQ positively and directly affect knowledge-sharing, potentially saving multinational corporations an estimated $31.6 billion (Vlajčić et al., 2019). Failure to knowledge-share is almost always due to a lack of CQ (Stoermer et al., 2020; Vlajčić et al., 2019).

In addition to having significant direct effects, all four dimensions of CQ have mediating and moderating effects (Fang et al., 2018). The simple relations among dimensions' mediating and moderating effects on phenomena have been broadly studied by researchers of CQ (Gooden et al., 2017; Ott & Michailova, 2018). What is missing

from the literature is what contribution (if any) the interactions between the dimensions make to the relations among CQ dimensions, related phenomena, and outcomes (Rockstuhl & Van Dyne, 2018). A deeper exploration of the interactions and relations among CQ dimensions would enhance the ability to improve positive outcomes in intercultural settings by improving the level of detail in the information given to managers, CQ training developers, and individuals who work and live in multicultural settings (Rockstuhl & Van Dyne, 2018).

Using the four-dimension model of CQ and the CQS developed by Ang et al. (2007) and validated by Van Dyne et al. (2015), I investigated the mediation, moderation, serial medication, parallel mediation, and moderated moderation among the four dimensions and contributed to the literature by increasing the knowledge about individual dimensions and their interrelations. I provided information on how and when CQ effects occur, thereby improving the information available to those developing training (see Ott & Michailova, 2018). Developing CQ to produce consistent results across populations and settings has global implications because a universal training program could be implemented in academic, corporate, medical, and community settings (Azevedo & Shane, 2019; Earley & Ang, 2003). Increasing CQ globally would reduce corporate losses but, more importantly, would reduce stereotyping and group-based injustice (Pawlicka et al., 2019; Vlajčić et al., 2019).

Literature Search Strategy

I began my exploration with a Google Scholar search to include books as well as articles without additional restrictions with the key term *cultural adjustment*, which

produced 2,980,000 results. I then searched the key term *cross-cultural adjustment* Google Scholar, which resulted in 611,000 articles and books. Once I decided to research CQ, I wanted a summary of what was currently known. This was the last search in which I drew solely from the Google Scholar database with the key term *cultural intelligence literature review*. This search produced 2,980,000 results. To deepen my knowledge of the construct and expand my search beyond Google Scholar, I conducted an extensive and comprehensive search using the following databases and search tools: EbscoHost, ProQuest, Sage, Wiley, Research Gate, Science Direct, Thoreau Multiple-database Search, Academic Search complete, Business Market Research Collection, EbscoHost EBooks, Emerald Insight, European Free Trade Association, Gale Academic One File Select, GoogleBooks, HathiTrust, IRMA International, Joanna Briggs Institute EBP Database, ProQuest Dissertations & Thesis Global, PsycArticles, PsycBooks, Psychology Database Combined search, Science Direct, and Springer. I limited the search to articles written in or after 2017. I additionally limited the search to only include peer-reviewed works.

In addition to databases, I included the website developed and maintained by Linn Van Dyne and others, the Cultural Intelligence Center, where peer-reviewed papers related to CQ are cataloged. I also included individual peer-reviewed journals in my literature search, specifically: *Management and Organizational Review*, *The International Journal of Management Education***,** *International Journal of Intercultural Relations*, *SA Journal of Human Resource Management*, *International Journal of Cross Cultural Management*, and *Journal of Management Education*. I additionally searched

Walden's database of dissertations. To further ensure I was including the most modern works on CQ, I corresponded by email with Dr. Ang and Dr. Van Dyne, the researchers who developed the Cultural Intelligence Scale. I met with a Walden librarian to gain insights into what other terms, if any, to search. When I was unable to find the text of articles or books, I wrote to the Walden librarian and asked for support in finding articles.

The discussed search strategies were applied to all the searches I made after reading Earley and Ang (2003) and a variety of literature reviews on CQ. To deepen my knowledge of the construct, I searched the following key terms: *cultural intelligence*, *development of cultural intelligence as a new form of intelligence*, and *history of the development of cultural intelligence*. I searched using a Boolean search strategy with the following terms: *cultural intelligence* and *human development*, *validation of the cultural intelligence scale* and *psychometrics*, *multicultural validation of the cultural intelligence scale* and *application*, *development of the short form cultural intelligence scale* and *cross culture validity*. To explore the connection between CQ and globalization, I used the following terms: *cultural intelligence* and *globalization,* and *cultural intelligence* and *international work assignments*. To explore whether and how CQ could promote positive social change in connection to globalization, I searched the following key terms: *what is globalization*, *cost of failed international assignments* and *cultural intelligence*, *cultural intelligence* and *multinational teams*, *cultural intelligence* and *knowledge-sharing*, *communication styles as an antecedent to cultural intelligence*, *how does communication styles and cultural intelligence impact globalization*, *how does communication styles and*

cultural intelligence impact multinational teams, and *how does cultural intelligence impact daily life in multicultural settings*.

In articles written about CQ's connection to globalization, many authors discussed the mediating and moderating properties of CQ. To explore what is known about CQ as a mediator and/or moderator, I searched the following key terms: *cultural intelligence as a mediator*, *cultural intelligence as a moderator*, *mediator/moderators of cultural intelligence*, *cognitive cultural intelligence as a mediator/moderator*, *metacognitive cultural intelligence as a mediator/moderator*, *motivational cultural intelligence as a mediator/moderator*, *behavioral cultural intelligence as a mediator moderator*, *interrelations among CQ factors*, *interrelations among CQ dimensions*, *motivational cultural intelligence as a moderator of metacognition*, *metacognition as a mediator of motivation*, *motivational cultural intelligence as a moderator of cognitive CQ*, *relationship between cognitive cultural intelligence and behavioral, motivational, metacognitive cultural intelligence*, *cognitive enrichment and cultural intelligence*, *relation among cultural intelligence factors*, *relation among cultural intelligence dimensions*, *how do CQ effects occur*, and *antecedents to cultural intelligence*. This search produced several papers that identified interrelations among the four dimensions of CQ, also referred to as factors as the next step in research (Gooden et al., 2017; Rockstuhl & Van Dyne, 2018).

This identification in the literature of research into interrelations between the dimensions as a gap shaped my research questions. To ensure this was a gap, I searched and set alerts in EbscoHost, ProQuest, and Google Scholar. I used the search-limiting

parameters to obtain only peer-reviewed articles and articles published no earlier than 2017. I searched the following key terms: *cultural intelligence as a mediator*, *cultural intelligence as a moderator*, *cognitive cultural intelligence as a mediator*, *cognitive cultural intelligence as a moderator*, *metacognitive cultural intelligence as a mediator*, *metacognitive cultural intelligence as a moderator*, *motivational cultural intelligence as a mediator*, *motivational cultural intelligence as a moderator*, *motivational CQ and serial mediation*, *metacognitive CQ and serial mediation*, and *motivational and metacognitive CQ as serial mediators* as well as the key terms *interrelations among CQ factors*, *interrelations among CQ dimensions*, *relation among cultural intelligence factors*, and *relation among cultural intelligence dimensions*. The alerts were set in 2019 and renewed until the completion of my research.

Some of the works on the mediating and moderating properties of CQ discussed how understanding the relations among factors would improve CQ training (see, for example, Gooden et al., 2017; Rockstuhl & Van Dyne, 2018). To explore the contemporary knowledge of CQ training, development, and outcomes, I searched using the above-mentioned databases, website, and journals, restricting the results to peer-reviewed articles and dissertations written no earlier than 2017 and using the following key terms: *cultural intelligence training*, *cultural intelligence training generalizability*, *cultural intelligence training in diverse population*, *CQ training on different populations*, *types of CQ training*, *CQ training methods and modalities of CQ training*, *relation among CQ factors and training*, *mediation and moderation of CQ and training individual factors*, *interrelations of CQ factors and training*, *interrelations of CQ dimensions and*

training, *interactions of CQ factors and outcomes*, *interactions of CQ factors and dimensions*, *mediation/moderation of CQ and impact on outcomes*, *interactions of CQ factors and relations to phenomena*, *interactions of CQ dimensions and relations to phenomena*, and *mediation/moderation of CQ and impact on specific outcomes*.

After reading the seminal and contemporary works about CQ, I began to investigate the theoretical foundations discussed in the CQ literature. I searched for information about the theories found most often throughout the CQ literature: activity theory, multiple intelligences theory, social learning theory, cultural intelligence theory, triarchic theory, biological theory of intelligence, and intelligence theory. After a review of these theories and the literature related to mediation and moderation as well as interactions among the four dimensions, the theories most relevant to my research were narrowed down to cultural intelligence theory and multiple intelligences theory. In addition to searching for information about the theories, I also searched for arguments against the theories. I limited the search to peer-reviewed articles. I searched the following key terms: *arguments against multiple intelligences theory*, *validation of multiple intelligences theory*, *psychometrics of multiple intelligences theory*, *multiple intelligences theory in the classroom*, *arguments against culture as a form of intelligence*, *arguments against the triarchic theory of intelligence*, *validation of the triarchic theory of intelligence*, *arguments against Earley and Ang*, and *arguments against the four-dimension model of CQ*.

After completing research on the foundational theories, I researched the theoretical underpinnings of Earley and Ang's (2003) original conceptualization of CQ. I

used the authors' reference list. I also searched the above-mentioned databases using the following key terms: *Sternberg's loci of intelligence*, *role identity theory*, *self theory*, *social cognition*, *inductive theory*, *cultural self-representation theory*, *self-efficacy theory*, *adaptation*, *what is metacognition*, and *biological intelligence theory*. I view my literature search as extensive because it resulted in a good mix of seminal and modern works.

Due to the inequities I witnessed during the COVID-19 global pandemic, I wondered if there was a connection to CQ. This was based on the literature I had read regarding the direct effects of CQ. I also realized that I had not researched CQ and medical outcomes. In 2021, I searched and set alerts in all the databases mentioned thus far for the following key terms: *COVID and CQ*, *Can CQ Improve COVID outcomes*, *CQ and hospital work*, *CQ pandemic*, *CQ distribution of vaccine*, *CQ and medical prejudice*, and *CQ and medical outcomes*. The alerts were set to run until my research was completed.

In summary, the described literature search strategy and key terms searched provided the depth and breadth of research necessary for me to formulate the foundation and conceptualization of my research as well as to identify the gap in the literature. The gap was how the interactions among CQ dimensions impact phenomena, outcomes, and training (Rockstuhl & Van Dyne, 2018; Sharma, 2019). The identified gap in the research shaped the development of my research questions and the selection of key terms used in alerts. When journal articles included repeated information, I excluded them and expanded my search to conference proceedings, books, and dissertations. When all

redundant material was removed, a good balance of historical and modern works on the topic of CQ, relevant theories, and the prosocial implications of the construct remained.

Theoretical Foundation

Earley and Ang's (2003) CQ theory was foundational for my research because I focused on the interrelations of CQ dimensions. I drew from Earley and Ang's CQ theory as well as Thorndike's (1920) and Gardner's 1983 (Gardner, 2013) theory of multiple intelligences to provide insights into autonomous but related intelligence domains. In this section, I begin with an exploration of Thorndike's introduction of multiple intelligences. I follow this by exploring by Gardner's 1983 expansion (Gardener, 2013). After that, I describe Earley and Ang's development of CQ theory. I close this section with a discussion of how multiple intelligences theory relates to my work.

Thorndike's Theory of Multiple Intelligences

Thorndike (1920) theorized that internal (cognitive) and external (behavioral) forms of intelligence are inherent in three autonomous but related types of intelligence: mechanical intelligence, the ability to learn about and understand how to manipulate the physical world; abstract intelligence, the ability to learn about, understand, and correctly use or manipulate symbols and ideas; and social intelligence, the ability to learn, understand, and manage human interaction. In 1928, Hunt developed and validated the George Washington University Social Intelligence Test and quantitatively validated social intelligence and supported Thorndike's hypothesis that abstract, mechanical, and social intelligence are distinct and separate forms of intelligence (Hunt, 1928).

A major criticism of multiple intelligences theory is that there is a lack of information on how the different forms of intelligence relate and interact (Davidson & Downing, 2006). My research contributed evidence to the validity and utility of multiple intelligence theory by exploring how the four autonomous domains of CQ (cognitive, metacognitive motivational, and behavioral) interact. Another major criticism of multiple intelligences theory was that it seemed incomplete, further calling into question the usefulness of the theory (Davidson & Downing, 2006). In 1983, Gardner introduced seven new autonomous and interacting domains of intelligence and included a means by which to identify new intelligences (Gardner, 2013).

Gardner's Theory of Multiple Intelligences

Gardner's 1983 theory of multiple intelligences included the following seven types of intelligence: linguistic, logic/mathematic, visual/spatial, musical, bodily-kinesthetic, interpersonal, and intrapersonal intelligence (Gardner, 2013)**.** The author defined these intelligences as follows. Linguistic intelligence is the ability to learn, and process spoken and written words, as well as manipulate language. Logic/mathematical intelligence is the ability to use dialectics as well as the ability to learn about and use a variety of representations and ideograms. Visual/spatial intelligence is the ability to learn about and understand a physical space through processing information about the space gained the sense of sight. Musical intelligence is the ability to understand or learn about facet of music such as notes, tones, chord, and sound as well as the instruments that make them. Bodily-kinesthetic intelligence is the ability to learn or understand space and time and where a person's body or objects are in that space time and be able to make

manipulations based on that understanding. Interpersonal intelligence is the ability to understand human interaction, and intrapersonal intelligence is the ability to understand thoughts about oneself and to be introspective about human interaction.

In addition to introducing the above seven domains, Gardner (2013) argued that areas of competence that could do any of the following should be considered a type of intelligence can be used to isolate brain damage. Gardener further explained that other attributes of intelligence domains include the ability to identify exceptional skill at the individual level, have a developmental history, create a specific expertise that could be displayed, Gardner further stated that intelligence domains would have a historical evolution, be psychometrically and experimentally validated via psychological tasks, define a core set of operations, and allow for symbolic encoding. Gardner, like Thorndike (1920), argued for the development of new measurements of intelligence. In 1987, with the support of Gardner, Shearer (2005) developed the Multiple Intelligences Developmental Assessment Scales, which has five versions. The five versions of the scale allow for each version to test a specific age group, ranging from four years of age to adulthood. Armstrong (2017) noted three major criticism of multiple intelligence theory, the first being a lack of empirical support. This criticism is difficult to justify given the psychometric validations of both Thorndike's and Gardner's theories of multiple intelligences (see, e.g., Hunt, 1928; Shearer, 2005), which provide empirical support.

Further criticisms stated by Armstrong (2017) are that there is no research to support the efficacy of the use of multiple intelligences in the classroom. Chan's (2001) quantitative development and validation of the student multiple intelligences profile,

based on Gardner's seven types of intelligences (Gardner, 2013), differentiated between types of giftedness in secondary-school children and is used in testing for multiple intelligences in Hong Kong schools. Chan noted that multiple intelligences provided a means to further identify giftedness and tap unconventional forms of intelligence, such as leadership, creativity, and object orientation, in the classroom. Chan's work demonstrated that multiple intelligences is applicable in schools. Earley and Ang's (2003) CQ theory is also a form of multiple intelligence and focuses on adults.

Earley and Ang's Theory of Cultural Intelligence

Earley and Ang (2003) theorized that the ability to read, interpret, apply, and display new culturally specific skills appropriate to culture of context is CQ. The authors theorized that there were three domains of CQ: cognitive/metacognitive, motivational, and behavioral. However, in Earley and Ang's (2003) chapter entitled "Cognitive bases of cultural intelligence," the authors differentiated between cognitive and metacognitive CQ roles and functions. In this chapter, Earley and Ang argued that metacognition is how individuals process cognitive knowledge and cognition is how people gather knowledge. The authors wrote that "cognitive CQ is an umbrella term for cognitive and metacognitive functions." Earley and Ang defined cognitive/metacognitive CQ as the ability to learn the rules, language, laws customs of a culture (cognitive) and the ability to understand and process that knowledge (metacognitive). The authors described motivational CQ as the drive to gather new cultural information and apply it. The researchers defined behavioral CQ as the ability to produced behaviors that are deemed intelligent and appropriate in the culture of context.

The biggest criticism of Earley and Ang's (2003) CQ theory is the inclusion of motivation as a unique intelligence dimension (Liao & Thomas, 2020a). Liao and Thomas (2020a) argued that viewing motivation as part of an intelligence construct was unusual and needed justification. Hanto and Inagaki (2017) stated that motivation plays a key role in the cognitive process of developing conceptual and procedural knowledge. The researchers explained that conceptual and procedural knowledge together are necessary for the creation of mental models (schemas) that result in the development of expertise. This matches Earley and Ang's argument that the drive motivational CQ creates is integral to the development of conceptual (metacognitive CQ), procedural knowledge (cognitive CQ), and expertise displays in cultural adaption (behavioral CQ). In 2007, Ang et al. quantitatively validated the four-dimension construct of CQ (cognitive, metacognitive, motivational, and behavioral CQ) as well the CQS a psychometric measurement of CQ. The CQS was used in my research.

Theoretical Relevance to the Current Study

Thorndike's (1920) introduction of the concept of multiple intelligences laid the groundwork for CQ theory by creating a new understanding of intelligence as something other than what had been historically measured in the classroom (Earley & Ang, 2003). Sharma (2019) pointed out that Gardner's 1983 theory of multiple intelligences introduced the concept of culture bound autonomous domains of intelligence that interact with one another (Gardner, 2013). Rockstuhl and Van Dyne (2018) argued that the next step in CQ research is to investigate the interactions among the four autonomous dimensions of CQ. Sharma (2019) found inconsistent results when testing the interaction

effects of cognitive and metacognitive CQ with other phenomena as the outcomes. Sharma investigated the impact of the interactive effects of CQ dimensions on other phenomena, the author did not directly explore the interactions among CQ dimensions. Sharma also did not expand multiple intelligence theory.

In my research I expanded multiple intelligence theory by providing further support for Gardner's (2013) as well as Earley and Ang's (2003) theory of interactive autonomous culture-based intelligences. My exploration of the interaction between the four autonomous dimensions of CQ provided information on how the different forms of intelligence relate and interact as called for by Davidson and Downing (2006). My research built on the work of Sharma (2019) as well as Rockstuhl and Van Dyne (2018), taking what those authors suggested as the next step in CQ research by investigating interactions among the four dimensions of CQ. I explore Rockstuhl and Van Dyne (2018) as well as Sharma (2019) more fully in my literature review.

Literature Review

In this literature review, I describe the development of CQ, examine the cohesiveness of the construct, and detail the validation of psychometric instruments the Cultural Intelligence Scale (CQS; Ang et al., 2007). This description is followed by an in-depth exploration of the literature on known antecedents of CQ. I also included a discussion of the effects of CQ. I summarize what is currently understood about a variety of training approaches, and why the current training approaches have failed to produce consistent outcomes across demographics (Azevedo & Shane, 2019).

To fully explore the knowledge available to researchers who develop CQ training, I included works on the mediation and moderation of CQ effects on phenomena. I also included works on CQ as a mediator and moderator of the relations among phenomena. In support of my research, I synthesized the literature to delineate what is known about the interactions among CQ dimensions. Specifically, I explored what is known about the higher-order relations and interactions among CQ dimensions. Through the synthases of these works I demonstrated that my research into the mediation moderation, serial mediation, parallel mediation, and moderated moderation relation among the dimensions filled a gap in the literature (Liao & Thomas, 2020c; Rockstuhl & Van Dyne, 2018; Sharma, 2019;). I began this review by first exploring the development of CQ as a construct and discussing the validation of two psychometric measures.

Cultural Intelligence Construct and Measures

Earley and Ang's (2003) original three-dimension model was grounded in Sternberg's (1986) conception of cognitive, metacognitive, and motivation as three different "loci" of internal mental intelligence and behavior as an external intelligence locus. As previously discussed, Ang et al. (2007) validated the four-dimension CQ model, which separates metacognitive and cognitive CQ and includes motivational and behavioral CQ. Ang et al. developed and validated the CQS. Van Dyne et al. (2015) validated the work of Ang et al. (2007). The CQS is the most widely used psychometric instrument in CQ research (Liao & Thomas, 2020c).

The second-most used psychometric for measuring CQ, the Short Form Cultural Intelligence Scale, was developed by Thomas et al. (2015). Thomas et al.'s (2008) three-

dimension model includes cultural knowledge, cultural skills, and cultural metacognition. This model was validated by Thomas et al. (2015). The factorization of CQ has driven two different schools of CQ research: those that draw from Earley and Ang (2003) and Ang et al.'s (2007) work, and those that draw from Thomas et al. (2008; see Liao & Thomas, 2020a).

Cultural Intelligence from Theory to Psychometrics and Validity

Ang et al. (2007) presented a paper on the development and validation of the four-dimension model of CQ at the 2004 Academy of Management Meetings Symposium on Cultural Intelligence in the 21st Century, New Orleans, Louisiana, published in 2007. The researchers found empirical support for four unique and distinct dimensions that came together to form the latent CQ construct (Ang et al., 2007). Rockstuhl and Van Dyne (2018) explained that latent CQ is general CQ and separate from the four dimensions. The authors found that the four dimensions had variations and overlap (shared variance). Shared variance is how much dimensions overlap in their capabilities and how much they differ or vary from one another, which is statistically observable (Kilby et al., 2015). Rockstuhl and Van Dyne explained that the overlap between the dimensions (shared variance) creates the fifth and unique dimension of latent (or general) CQ.

In addition to validating the four-dimension model, Ang et al. (2007) developed and validated the CQS by performing exploratory factor analysis on an initial set of 40 items, finding a four-dimension model with related subscales (pairwise correlations of .21–.45) that had significant ($p < .05$) standardized factor loadings (.52–.80). The

researchers applied reliability analysis to this set of 40 items and conducted a comprehensive series of specification searches in which 20 items were deleted. The 20 items with the strongest psychometric properties were retained to create the CQS. This work validated Earley and Ang's (2003) CQ theory. Ang et al.'s work was validated by Van Dyne et al. (2015).

Both Van Dyne et al. (2015) and Ang et al. (2007) used populations from Singapore and the United States because both countries are multicultural and populated with people from a variety of countries, which improves the cross-cultural reliability of the CQS. The CQS is accepted as a measure of CQ that is valid for use with multicultural populations (Liao and Thomas, 2020c). Liao and Thomas (2020d) acknowledged the validity of Ang et al.'s four-dimension CQ construct and the CQS and argued for the validity of Thomas et al.'s (2008) three-dimension construct and the Short Form Cultural Intelligence Scale (SFCQ) developed by Thomas et al. (2015). The SFCQ was developed to provide a psychometric instrument that could measure CQ as conceptualized by Thomas et al. .

Thomas et al. (2008), like Earley and Ang (2003), argued that CQ is a new form of intelligence that is separate and distinct from general, emotional, and social intelligence. Thomas et al. argued that unlike in Earley and Ang's model, CQ exists outside of culture-bound intelligence. Earley and Ang , who drew from Gardner's earlier argument published in 2013, stated that CQ is not itself bound to a specific culture but what is deemed intelligent is culture bound. Thomas et al. did not address this argument by Earley and Ang .

Thomas et al. (2008), similarly to Earley and Ang (2003) argued that CQ is evident by the ability to produce behavior that is viewed as intelligent in specific cross-cultural settings via adjustment. Earley and Ang also argued that CQ is the ability to produce intelligent behavior but argued that this was not a matter of adjusting to cross-cultural constructs; rather, CQ promotes shifts in thinking that result in the ability to read, interpret, apply, and display skills that will be viewed as intelligent in cultures other than one's own. Earley and Ang argued that CQ allows individuals to adjust to new cultures and succeed in cross-cultural settings because of a new understanding of the role cultural plays in how an individual is perceived. Beyond differences in what develops CQ, Thomas et al. and Earley and Ang also disagreed on the specific dimensions and what should be included in each of the dimensions.

Thomas et al. (2008) described their "cultural knowledge" dimension as similar to the "cognitive CQ" dimensions of Earley and Ang (2003) and Ang et al. (2007): cultural knowledge or cognitive CQ is the awareness of and ability to acquire new knowledge about culture. Thomas et al. also included knowledge of self, organization of knowledge, processing of knowledge, and problem solving as part of their cultural knowledge dimension. Earley and Ang theorized, and Ang et al. validated these aspects as being part of metacognitive CQ. Thomas et al.'s definition of their second dimension (cultural skills) is like Earley and Ang's definition of behavioral CQ, but there are noteworthy differences. A major difference between Thomas et al.'s "cultural skills" and Earley and Ang's "behavioral CQ" is the inclusion of perceptual skills in the former.

Thomas et al. (2008) argued that the perceptual skills of open-mindedness, tolerance of uncertainty, and non-judgmentalness regarding cultural constructs are part of cultural skills. Thomas et al. also stated that the relational skills of empathy, flexibility, and sociability are part of their skills dimension. Earley and Ang (2003) theorized that to acquire perceptual and relational skills requires knowledge of cultural norms (cognitive CQ), the ability to process and apply knowledge to self (metacognitive CQ), and the focus to acquire the specific knowledge, the drive to process it, and the desire to apply it to self (motivational CQ), which results in behaviors that reflect open-mindedness, tolerance of uncertainty, non-judgmentalness, empathy, flexibility, and sociability (behavioral CQ). The third dimension in Thomas et al.'s CQ model is cultural metacognition.

Thomas et al. (2008), Earley and Ang (2003), and Ang et al. (2007) included the monitoring of thoughts and processing of information in their definitions of metacognitive CQ. All the authors agree that metacognition manages cognition. Thomas et al.'s cultural metacognition includes self-regulation and monitoring of goals. Sternberg (1986) identified these as aspects of motivational intelligence, and Earley and Ang argued that they are aspects of motivational CQ, which Ang et al. validated. Despite this, Thomas et al. argued against the inclusion of motivational CQ as a separate dimension on the grounds that it would mislead people into believing that CQ was an inherently pro-social construct, rather than a form of intelligence.

Aspects of motivational CQ are woven throughout Thomas et al.'s (2008) definitions of all their dimensions. Additionally, Earley and Ang (2003), in line with

Sternberg (1990), argued that motivation is not necessarily pro-social, and is a key component of intelligence because it provides the drive to acquire and apply knowledge. The inclusion of motivation in intelligence constructs was validated by Sternberg et al. (1996). Thomas et al.'s model has different dimensions that require a different psychometric instrument than Ang et al.'s (2007) CQS (Liao & Thomas, 2020c). Thomas et al. (2015) developed the SFCQ as a psychometric instrument and validated Thomas et al.'s (2008) CQ construct.

The validation of the SFCQ (Thomas et al., 2015) followed a mixed-method approach in which the validity of the construct was assessed qualitatively, and its reliability and construct validity were asserted to have been validated quantitatively. Thomas et al. (2015) reported validating the dimensions of knowledge, skills, and metacognition quantitatively by an unspecified "sophisticated" method that had "limited acceptance and utility" (p. 5). To produce a more widely accepted form, they chose 10 items from the original instrument based on theory. These ten items constitute the SFCQ.

Quantitative validation of some aspects of the SFCQ, such as construct validity, was performed by selecting subsets from among 14 samples for each test, and in some cases selecting subsamples from those subsets of samples (Thomas et al., 2015). An alpha value of 0.10 was used for significance testing, and in cases where no significance was found, other measures, such as the root-mean-squared-error, were used to assert validity. The scores on the SFCQ were compared against various measures, including emotional intelligence, the Big Five Personality traits, having a close friend from a different culture, and whether the respondent had lived abroad. Thomas et al. (2015) reported that these are

significantly correlated with SFCQ, although the tests of correlation differed between instruments. The tests used were logistic regression, ordinary regression, Pearson's correlation, the vanishing tetrad test, comparative fit index, and confirmatory factor analysis with maximum-likelihood estimation and mean structure analysis. These tests were applied to subsets of participants that the authors chose on theoretical grounds for each test (e.g., in some tests, only those with a close friend from another culture were included; in other tests, nationals of certain countries were excluded). Liao and Thomas (2020b) acknowledged that there is more work to be done regarding the validation of the SFCQ.

Thomas and Liao (2020c) acknowledged the validity of Ang et al.'s (2007) four-dimension model and psychometric instrument. Ang et al. was also validated by Van Dyne et al. (2015). In my research, I used the CQS because it is the psychometric instrument most widely used in CQ research (Fang et al., 2018). After validating the CQS, Ang et al. called for an exploration of antecedents, which are discussed in the next section.

Antecedents of Cultural Intelligence

Ang et al. (2007) argued that the next step after validating the four-dimension model was to build the CQ nomological network. Ang et al. argued that this should begin with studying antecedents of CQ. Earley and Ang (2003) in their theoretical introduction of CQ argued that personality traits are highly likely to be predictive of CQ development. Earley and Ang explained that personality traits are fixed and CQ states are malleable characteristics that change depending on setting. Ang et al. (2006) were the first to study

antecedents of CQ and investigated whether personality traits had a predictive relation with CQ (Fang et al., 2018)

The Big Five Personality Traits and CQ

Ang et al. (2006) used the Personality Characteristics Inventory (Mount & Barrick, 1995) to measure personality traits. These five personality traits would become commonly known as the Big Five Personality Traits among personality scholars (Carver & Scheier, 2000). Mount and Barrick (1995) described the Big Five personality traits as (a) extraversion: sociable, assertive, surgency, active, ambitious; (b) agreeableness: likeable, good-natured, friendly, cooperative, trusting; (c) conscientiousness: responsible, willed to achievement, able to plan, organized, persistent, achievement-oriented, dependable; (d) emotional stability: emotional control, calm, secure, not nervous, not anxious; and (e) openness to experience: imaginative, intellectual, inquiring intellect, artistically sensitive. Ang et al. used the CQS developed by Ang et al. (2004), which was published in Ang et al. (2007), to measure the four dimensions of CQ, also referred to as factors in the literature of CQ: cognitive, metacognitive, motivational, and behavioral.

Ang et al. (2006) quantitatively found relations between the personal traits and CQ dimensions. Conscientiousness was positively related to metacognitive CQ. Agreeableness was positively related to behavioral CQ. Emotional stability was negatively related to behavioral CQ. Extroversion was positively related to motivational CQ and behavioral CQ. Openness was positively related to all four dimensions of CQ. An expansion on Ang et al. findings are the results of Harrison, (2012), who found that the personality traits of agreeableness and openness are predictors of latent CQ. Latent CQ,

also referred to as general CQ, is created by the variations and overlap (shared variance) of the four-dimensions of CQ (Rockstuhl & Van Dyne, 2018). Alexandra**, (**2018b) also studied antecedents of latent CQ and specifically whether perception of disconfirmation is also an antecedent of latent CQ.

Intercultural Contact and International Experience

Alexandra **(**2018b) explained that how often a person attributes cultural mistakes to their own misconception about cultural expectations is perception of disconfirmation. The author argues that perception of disconfirmation is a social belief and, as such, should be predictive of latent CQ. In the rest of this section, latent CQ is simply referred to as CQ. Alexandra investigated the relation between perception of disconfirmation and CQ in management training at an Australian university, gathering information from a sample representing 31 nationalities (45% from China, 17% from Australia, and 38% from other 29 countries) who participated in an experiential learning course. The author found that perception of disconfirmation predicted CQ development. Alexandra (2018b) explored how the individual's perception of cross-cultural contact impacted the development of CQ and Alexandra et al. (2021) furthered this investigation.

Alexandra et al. (2021) found that an individual's perception of inclusion in multicultural settings impacted the development of CQ and that this relation was moderated by perceived cultural diversity. The authors argued that individuals who think that they will be included in work group activities, can influence decisions, and are allowed access to information perceive themselves as being included, which fosters the development of CQ. The authors also argued that the higher individual perception of the

group's diversity the greater the relation between perceived inclusion and CQ development. The researchers found that the relation between perceived inclusion and the development of metacognitive and behavioral CQ was stronger when perceived diversity was high. Alexandra et al. were not the only researchers to look beyond experiences and into internal states as possible antecedents to CQ. Jyoti and Kour (2017) looked beyond the external and examined the relations between CQ and other forms of intelligence.

Social Intelligence, Emotional Intelligence, and CQ

Jyoti and Kour (2017) explored emotional and social intelligence as antecedents of CQ among managers of national banks in India. The managers all had experience working in different states in India. The researchers found that both emotional and social intelligence were predictors of CQ and were antecedents of each of the four dimensions of CQ. Putranto et al. (2018) focused solely on emotional intelligence as an antecedent to CQ, providing insights into student performance in business school. The researchers found that emotional intelligence is an antecedent of CQ. The authors found that CQ did not impact the grades of students and argued that this may be because courses were not developed with the aim of grading papers while factoring in multicultural perspectives. Putranto et al. also found that international holiday travel did not increase CQ. They argued that this may be due to limited communication with foreign nationals because travelers are likely to have focused on communication within their groups. Along these lines Ramasubramanian and Banjo (2020) explored communication, cultural relativism, and CQ.

Communication Styles and CQ

Ramasubramanian and Banjo (2020) explained that cultural relativism is how an individual decides which aspects of their cultural identity and intersectionality relates to any given situation, and that this is an antecedent of CQ. Adair et al. (2016) identified spatial context communication as an additional part of cultural relativism for those individuals who rely on environmental cues such as the external physical space in which the communication takes place. In contrast, temporal-focused individuals are internally focused on how people move through and relate to time. Within each of these, the authors argued that interdependent and dependent communication styles affect how much a person will attend to others or themselves, respectively, in a given context. The authors found that people with interdependent context-dependent communication styles had higher CQ than other types of communicators did.

CQ antecedents are diverse. They include personality attributes such as the Big Five personality traits, international work experience, international contact, perception of inclusion in diverse groups, emotional and social intelligence, cultural relativism, and communication style (Ang et al., 2006; Adair et al., 2016; Alexandra et al., 2021; Ramasubramanian & Banjo, 2020). The study of antecedents of CQ continues because of the role they play in the development of the CQ nomological network as well as CQ training (Ott & Michailova, 2018). Putranto et al. (2022) conducted a literature review and found there are currently two main approaches to CQ training. These are explored in the next section.

Cultural Intelligence Training

Putranto et al.'s (2022) literature review of CQ training found that cognitive and experiential learning are the two main approaches. Putranto and colleagues stated that cognitive approaches focus on giving learners knowledge in a way that is designed to foster the development of new schemas. Cognitive approaches as explained by Putranto et al. allow learners to learn from their mistakes, creating the ability to adapt knowledge gained to a variety of context and situations, and are primarily used in the classroom. Putranto et al. argued that the focus of experiential learning is converting experiences into knowledge. The authors explained that this is based in a four-step learning cycle. The researchers stated that the four cycles are concrete experiences, reflecting on observations and experiences, processing abstract knowledge, and exploring the application of new knowledge through experimentation.

Putranto et al. (2022) divided the CQ training research into approaches and found the method most often used was experiential. In this section, I provide a small sample of the training literature because one of the goals of my research is to provide information to researchers in the field of CQ training development. In this section, I have divided the literature into two subsections based on approach (experiential or cognitive). I begin with a discussion of Young et al.'s (2017a) experiential approach.

Experiential

Young et al.'s (2017a) experiential approach used a diversified mentoring program. Young et al. began with the mentors and mentees getting to know each other in a 2–3 hour meeting before engaging in 20 hours of activities over four weeks. Young et

al.'s experiential learning training culminated in the mentees performing various duties required in the preparation and serving of a multi-course meal in which the mentees' performances were assessed by the mentors. The experiential learning activities engaged in by the mentees were predominately preparation for the successful execution of their duties to serve the multi-course dinner, including food and wine pairing.

Prior to serving the meal, the mentees engaged in activities prepared by the mentors, which included skills assessments, interviews, and a selection process for the duties to be executed during the dinner. The mentors also completed a post-dinner appraisal of the mentees' performance. The researchers found that the diversified mentoring relationship raised mentors' metacognitive and behavioral CQ. The impact on mentees' CQ was not assessed. Mentors completed the diversified mentoring program in the middle of the academic term and the impact on CQ was after the completion of the term. Young et al. (2017a) used a purely experiential approach to research the impact of cross-culture engagement on the development of CQ. Azevedo and Shane (2019) used a blended approach of in-person workshops (experiential) and online courses (cognitive).

Azevedo and Shane's (2019) research included students and working professionals. The students participated in workshops spread across two weekends with online components. The working professionals underwent a condensed workshop delivered over the course of one weekend with an online component. Both formats used a blend of activities. There was a significant difference between the workshops for the students and professionals.

The student workshop was designed to create a "knowing–doing–reflecting" dynamic. The knowing portion was designed to teach participants about CQ and how each of the four dimensions develop; doing included journaling, mindfulness exercises, experimenting with intercultural situations, and participating in a team project; reflecting used a combination of self-reflection activities and group discussions. The authors did not describe the specific mindfulness exercises but did say that the purpose of incorporating mindfulness was to improve attention and awareness. The condensed workshop designed for the professionals did not have a "knowing–doing–reflecting" dynamic.

Specifically, in the workshop for professionals there were no individual or group activities. The condensed workshop consisted primarily of lectures with a question-and-answer session at the end of the day. Both versions of the workshop included self-study and homework. The MBA students had "large" improvement in motivational, metacognitive, and cognitive CQ and "moderate" improvement in behavioral CQ after completing the workshop. The working professionals experienced a "large" improvement in metacognitive and behavioral CQ, "moderate" improvement in cognitive CQ, and "small" improvement in motivational CQ. The researchers argued that the difference in results may be due to fewer opportunities for self-reflection for professionals along with a lack of individual or group assignments. Shepherd's (2019) meta-analysis explored workshops that were conducted in a classroom setting with a more cognitive approach.

Cognitive

Shepherd (2019) conducted a meta-analysis focused specifically on the efficacy of workshops taught in a classroom setting. Shepherd's population was healthcare workers

and corporate professionals. The researcher reviewed workshops that ranged in length from one hour to several days. The author explained most workshops focus on five aspects of culture: history, belief systems, interaction approaches, discrimination, and organizational institutional issues.

Shepherd (2019) explained that history generally covered the impact of colonialism and how it led to the creation of a legal system that is rife with discriminatory laws and legislation. History also included how colonialism led to land disposition, oppression, and forced acculturation. Workshop sessions focused on belief systems included how different cultural, societal, familial, and religious structures and belief impact approaches to healthcare, mental health, communication styles (both verbal and nonverbal), and which topics are considered taboo. Interaction approaches explored how different cultures communicate, covering greetings, rapport building, how to avoid cultural taboos, and repair of relationships. Discrimination covered racism, micro- and macro-aggressions, implicit bias, discriminatory practices in the workplace and society, and the structural imbalances that keep these practices in place. Organizational and institutional issues focused on improving community outreach, diversity in hiring and mentoring, as well as how to promote anti-discrimination practices. These topics were covered in the workshops reviewed by Shepherd.

Shepherd (2019) argued that the workshops reviewed lacked efficacy because they were developed without enough cultural diversity to allow for multicultural perspective taking during development and delivery. Shepherd stated that the existence of persistent cultural biases is evidence that CQ workshops set in classrooms are not

effective in creating real-world demonstrations of CQ. Fakhreldin's (2020) research was designed to explore whether courses delivered in a classroom could raise CQ. Specifically, Fakhreldin investigated whether cross-cultural management courses would increase all four dimensions of CQ in Egyptian students.

Fakhreldin (2020) found that the courses had different effects on male and female students. The author found that male students had all four dimensions increased, with the greatest changes in metacognitive and behavioral CQ; among female students, the greatest increases were in cognitive and behavioral CQ. Fakhreldin explained that the largest gains were in the CQ dimensions that tested lowest for each group prior to taking the course. The author also found that there was a change in which dimensions were highest in those with international travel experience.

Fakhreldin (2020) found the course raised all four dimensions of CQ (unevenly) for those with international travel experience. However, prior to taking the course they scored highest to lowest in motivational, behavioral, metacognitive, and cognitive CQ. After the course, this order was behavioral, metacognitive, cognitive, and motivational CQ. The author posited that the increase in opportunity to gain applied CQ skills accounts for the gains in behavioral CQ. The author explained that the gains in motivational CQ were not as significant in students with international experience.

Fakhreldin (2020) posited that because students with international experience were already highly motivated to learn about other cultures and apply their learning, their motivational CQ was not expected to increase. The researcher found that students with international experience also had greater latent CQ gains than those who did not. When

examined qualitatively, the students' cognitive CQ did not increase but there were increases in metacognitive, motivational, and behavioral CQ. The author explained that this may be due to the high level of multicultural knowledge the students acquired via other coursework and international experience prior to taking the course.

Fakhreldin (2020) argued that a limitation to this study was the lack of validation of how the course will impact the real-world experiences of the participants. Research into training programs and the development of CQ, such as the research described in Fakhreldin , uses a variety of teaching techniques designed to improve real-world outcomes for students but researchers have often failed to assess post-graduation results. For example, the course used in Fakhreldin's research was taught via blended learning techniques, case studies, and videos, but did not explore what happens after the students enter the workforce. Research that focuses beyond the academic arena and investigates training in the workplace or with professionals requires real-world settings (Earley and Peterson, 2004).

Researchers who work with professionals in multicultural settings sometimes have different findings than those who work with student populations. For example, Azevedo and Shane (2019) demonstrated that workshops can raise CQ in working professionals and students; however, the gains were not consistent between populations. Shepherd (2019) argued that workshops have been a training method for some time, so the lack of CQ in society, hospital workers, and professionals shows that this method does not create long-lasting universal results. Developing CQ training that creates

substantive long-term effects is important because of the nature of CQ's direct effects (Ang et al., 2007).

Direct Effects of CQ

Ang et al.'s (2007) work laid the foundation for research into the direct effects of CQ. The researchers found CQ directly affects the ability to expand existing cultural views and move away from monoculturalism. Monoculturalism (or the belief in the existence of a cultural group based on a single identifier, such as country of origin) is considered a biased view because all aspects of life contribute to individual culture (Roux & Suzuki, 2017). The belief in monoculturalism is the byproduct of implicit and explicit bias. These biases lead to the marginalization of people via the creation of stereotypes (Levin et al., 2016). Ang et al. found that cognitive CQ positively and directly impacts the ability to expand existing mental imagery of culture and that metacognitive CQ creates the ability to move beyond cultural stereotypes. The authors explained that these two abilities result in improved cultural judgment making. Cultural judgement making is the ability to take the perspective of the culture of context into account when making decisions**.** Cultural perspective taking reduces stereotyping as well as implicit and explicit bias by creating the mental flexibility necessary to view people as individuals (Levin et al., 2016).

Ang et al. (2007) found that motivational CQ improves self-efficacy, mental flexibility, and willingness to interact socially in multicultural settings and that behavioral CQ directly affects the ability to enact culturally appropriate behaviors, resulting in improved interactional and general adjustment. Ang et al. explained that interactional

adjustment is setting-specific and general adjustment is not. In addition to finding that these dimensions reduce implicit and explicit bias, Ang et al. also found that motivational and behavioral CQ predict wellbeing. The relations found by Ang et al. are supported by the findings of other studies discussed in this section (see, for example, Sharma & Hussain, 2017). Ang et al. explored CQ's effects on phenomena that reduced implicit and explicit bias, found a relation between CQ and wellbeing, and documented CQ's effect on performance in academic and nonacademic settings.

Following the structure arising from Ang et al.'s (2007) work, I have divided this section of the literature review into four parts: CQ's effects on explicit and implicit bias, CQ's effects on wellbeing, CQ's effects on performance in academic settings, and finally CQ's effects on performance in nonacademic settings. Ang et al. argued for more research into CQ's direct effects and specifically into the relation between CQ and ethnocentrism. Following Ang et al.'s suggestion, I begin the next section with a discussion of studies on the relation between CQ and ethnocentrism.

CQ's Effect on Implicit and Explicit Bias

Young et al. (2017b) employed a quasi-experimental field design to research the relation between ethnocentrism and CQ. Both the treatment and control groups comprised students from Mountain West University in the US. Ethnocentrism was measured by using the revised Generalized Ethnocentrism questionnaire (Neuliep & McCroskey, 1997). Young et al. explained that ethnocentrism is the belief that an individual's culture of origin and cultural norms are superior to those of other cultures. Young et al. measured CQ with the CQS developed by Ang, et al. (2007).

Young et al. (2017b) found that latent CQ and three of the four dimensions (metacognitive, motivational, behavioral) were negatively correlated with ethnocentrism. Cognitive CQ had no proven relation with ethnocentrism. To understand the relations more deeply between CQ dimensions and ethnocentrism, the authors regressed all four CQ dimensions against ethnocentrism and found only motivational CQ significantly predicted ethnocentrism. They argued from this that more research into the interactions among CQ dimensions is warranted, and particularly the interaction between cognitive and motivational CQ and the effect on ethnocentrism. The authors argued this would add to our knowledge of CQ's effects. Rockstuhl and Van Dyne (2018), like Young et al. focused on the relations that individual dimensions of CQ have with other phenomena.

Rockstuhl and Van Dyne (2018) conducted a meta-analysis and used meta-analytical structural equation modeling derived from correlation matrices developed by Harrison et al. (2006) and a theory-testing method developed by Viswesvaran and Ones (1995). Rockstuhl and Van Dyne also validated a bi-factor model of CQ by testing five dimensions: each of the four CQ dimensions (cognitive, metacognitive, motivational, and behavioral) as four "lower" dimensions and a latent dimension of CQ as the fifth "upper" dimension. The authors found that CQ includes a latent construct (overall CQ) arising from four autonomous types of intelligence as well as four autonomous dimensions (the lower dimensions). Rockstuhl and Van Dyne found that a bi-factor model for CQ incrementally predicted intercultural judgment and decision-making, sociocultural adjustment, psychological wellbeing, observer-rated task performance, observer-rated citizenship performance, and observer-rated leadership performance, over and above the

use of CQ as a latent factor/dimension. The authors argued that this demonstrates that CQ dimensions have both individual and shared effects on phenomena and that a bi-factor model is the best in conceptual fit.

Rockstuhl and Van Dyne (2018) also found that latent CQ, cognitive CQ, and metacognitive CQ predict intercultural judgment and decision making. In their study, latent CQ and motivational CQ were positively related to sociocultural adjustment and psychological wellbeing. Metacognitive and behavioral CQ were positively related to task performance. Latent CQ as well as motivational and behavioral CQ were positively related to citizenship performance. Latent CQ was positively related to adaptive performance. Latent CQ and motivational CQ were positively related to leadership performance. Metacognitive and cognitive CQ had a significant effect on intercultural judgment and decision making. Motivational CQ had a significant effect on social cultural judgment.

Rockstuhl and Van Dyne (2018) also found both mediated and moderated relations among the dimensions and phenomena. These relations are described further in the present study's section about mediation and moderation. Rockstuhl and Van Dyne argued that their results demonstrated the direct effects of latent CQ and CQ dimensions on phenomena that improves an individual's performance in multicultural settings. The relations found by Rockstuhl and Van Dyne further demonstrated that CQ has direct effects on phenomena that reduce implicit and explicit bias via the improvement of function and decision making in multicultural settings, which reduces stereotyping (Levin et al., 2016).

Pawlicka et al. (2019) also studied the relations between CQ and phenomena that reduce stereotyping as well as implicit and explicit bias. Social closeness reduces implicit and explicit bias by increasing openness to others' values and beliefs (Levin et al., 2016). Pawlicka et al. used the CQS developed by Ang et al. (2007) to measure CQ. The researchers used the inverted Bogardus Social Distance Scale (Bogardus, 1928) and the Feeling Thermometer (Lupton & Jacoby, 2016) to measure the degree of social closeness felt by Polish students toward Syrian refugees. The researchers found a direct and positive relation between metacognitive and motivational CQ and social closeness on the inverted Social Distance Scale. When using the Feeling Thermometer, the only main effect found by the researchers was between motivational CQ and social closeness. The researchers also found that latent CQ was predictive of social closeness. Several mediating effects for CQ, which are discussed more deeply in the mediation section of this review, were also found by the researchers.

Pawlicka et al. (2019) used the Empathic Sensitiveness Scale developed by Kazmierczak et al. (2007) to measure three dimensions of empathy: emotional empathy/empathetic concern, emotional empathy/personal distress, and cognitive empathy/perspective taking. Emotional empathy/empathetic concern is understanding the suffering of others and feeling concern for them based on that understanding. Emotional empathy/personal distress is understanding others' suffering such that rather than simply feeling concern the person feels the perceived suffering. Cognitive empathy/perspective taking is considering other people's perspective and trying to see things from perspectives different than the viewer's own.

Pawlicka et al. (2019) also measured empathy using the Polish version of the Davis scale developed by Konrath et al. (2018). Trait empathy includes emotional empathy/personal distress and cognitive empathy/perspective taking. Pawlicka et al. refer to the combination of emotional empathy/empathetic concern and cognitive empathy/perspective taking as "other-oriented empathy." The researchers found that other-oriented empathy was positively related to all four dimensions of CQ. Because of the positive relations between CQ and empathy, the authors argued that their study demonstrated that CQ results in an improved ability to self-regulate emotions, be aware of how others are feeling, engage in cultural perspective taking, and reduce social distance. All of these reduce implicit and explicit bias (Levin et al., 2016). Hani et al. (2020), like Pawlicka et al., also explored the relation between CQ and internal reactions to people from other cultures.

Hani et al. (2020) investigated the relations among cultural intelligence, communication skills, and social interactions, studying emergency department staff working at three hospitals (Ayatollah Mousavi, Vali Asr, and Beheshti hospitals) affiliated with Zanjan University of Medical Sciences in Iran. The authors explained that the population was multicultural due to the inclusion of both Sunni and Shia Muslims as well as Kurdish people and individuals from China, Afghanistan, and Turkey. Hani et al. used the CQS to measure CQ. The authors measured social interaction with the Social Interaction Self-Statement Test (SISST) developed by Glass et al. (1982). The SISST has fifteen items to measure negative thoughts and fifteen items to positive thoughts in communication. Hani et al. explained that when an individual scores high in negative

(resp., positive) thoughts, this reflects weak (resp., strong) social interaction skills and indicates the individual is more (resp., less) likely to believe negative stereotypes, resulting in strong (resp., weak) feelings of fear and anger in social situations. Hani et al. used the eighteen-item Communication Skill Inventory developed by Ersanli and Balci (1998) to measure three dimensions of communication skills (verbal, listening, and feedback), with each having six items on the scale.

Hani et al. (2020) found that latent CQ and overall communication skill were positively related. The authors found a significant and positive relation from cognitive and metacognitive CQ to verbal skill. The authors also found a significant and positive relation from cognitive and motivation CQ to listening skill. The researchers found a significant and positive relation between behavioral CQ and feedback skill. When investigating the relation between CQ and social interaction, the authors discovered that an increase in latent CQ was correlated with an increase in positive thoughts. Hani et al. found that for latent CQ and three of dimensions of CQ (cognitive, motivational, and behavioral), higher levels were associated with fewer negative thoughts.

Hani et al. (2020) argued that emergency room staff need to communicate multiculturally to reduce negative medical outcomes for patients, indicating a need for CQ in hospitals. Hani et al.'s work reflects how CQ can impact health outcomes because of its impact on positive feelings and intercultural communication. The researchers discussed that, thus far, CQ has between demonstrated to have a significant and direct relation with reducing implicit and explicit bias, a relation also noted by Ang et al.

(2007). Ang et al. Also found a direct relation between CQ and wellbeing. Literature that further supports Ang et al's finding on this is discussed in the next section.

CQ's Effect on Well-Being

Ang et al. (2007) found a relation between CQ and wellbeing, a finding later duplicated by Mehra and Tung (2017). Mehra and Tung, like Ang et al., also studied the relation between CQ and adjustment. Mehra and Tung's population consisted of post-graduate students at Guru Nanak Dev University, Amritsar and IIM-Amritsar in India. Mehra and Tung measured five dimensions of wellbeing (self-esteem, sociability, joviality, happiness, and emotional stability) on the Well-Being Scale (Freidman, 1994). Mehra and Tung measured CQ using the CQS. The researchers focused on four aspects of adjustment (home adjustment, health adjustment, social adjustment, and emotional adjustment) measured by Bell's Adjustment Inventory (Ojha, 1999).

Mehra and Tung (2017) found CQ predicted both wellbeing and adjustment. They also found that the higher an individual's CQ levels, the more well-adjusted they were. The researchers found that greater CQ levels also resulted in a higher degree of wellbeing. CQ's direct relation with wellbeing is also indirect, being mediated by adjustment. The positive relations from CQ to wellbeing and adjustment further support Ang et al.'s (2007) finding and demonstrate the construct's ability to reduce implicit and explicit bias (Levin et al., 2016). Mehra and Tung investigated the relations from latent CQ to other phenomena (ignoring individual CQ dimensions), and Gebregergis et al.'s (2019) adopted this approach as well.

Gebregergis et al. (2019) quantitatively studied the relations among CQ, age, prior travel experience, acculturative stress, and depression in international students studying in China. The regions of origin for the students were Asia (45%), Africa (41%), and the last 14% from other global regions (specifically, Europe, Oceania, Latin America, and North America). In the study, the CQS was used by to measure CQ, and the Acculturative Stress for International Students Scale, developed by Sandhu and Asrabadi (1994), to measure acculturative stress. Gebregergis et al. explained that acculturation is the ability to conform to cultural norms and acculturative stress is a reflection of how difficult that process can be.

Gebregergis et al. (2019) argued that acculturative stress results in increased anxiety and is detrimental to wellbeing. The authors explained that acculturative stress may develop into depression that manifests as a loss of interest in engagement, low self-worth, insomnia, difficulty concentrating, increased feelings of guilt, and low energy. The authors measured depression using the Center for Epidemiological Studies Depression Scale developed by Radloff (1977). Latent CQ was found to have a direct and negative relation with acculturative stress and depression. The mediating relation of acculturative stress in the relation between CQ and depression will be discussed later in this review. Gebregergis et al. established a relation between acculturative stress and latent CQ, and Mosanya (2019) established a similar relation between latent CQ and academic stress.

Mosanya (2019) studied the relation from latent CQ to growth mindset, grit, coping, and academic stress in students in the United Arab Emirates. All students spoke English fluently and were from 33 countries in five regions described as South Asian

(66% of students), Arab (17%), Western (8%), African (7%), and Far Eastern (2%). The author measured CQ using the CQS. Mosanya (2019) used the Interpersonal Stress Coping Scale developed by Kato (2013) to measure constructive coping; the Implicit Theories of Intelligence Scale developed by Dweck (1999) to measure mindset; the Grit Scale developed by Duckworth and Quinn (2009) to measure grit; and the University Student Stress Scale – Academic Stress Subscale developed by Burge (2009) to measure academic stress. Mosanya explained that the Grit Scale contains questions about trait-level perseverance and passion and that the University Student Stress Scale – Academic Stress Subscale has questions about how students feel about a variety of academic activities and how subjectively stressful they are, with responses used to measure academic stress.

Mosanyo (2019) found that CQ has direct and positive relations with growth mindset, grit, and constructive coping and a negative relation with academic stress, meaning that individuals with higher CQ have lower academic stress. Mosanyo found that CQ has a predictive relation with constructive coping. Mosanyo explained that individuals with high CQ are better equipped to cope with stress and, as a result, are likely to have a strong sense of wellbeing. Mosanyo's work further supports Ang et al.'s (2007) findings. Mosanyo (2019) investigated the relations between latent CQ and phenomena that are related to wellbeing (an interest common to all studies discussed in this subsection). Ramalu and Subramanim (2019) continue this trend by investigating the relation between CQ and psychological need satisfaction.

CQ's Effect on Performance Outcomes in an Academic Setting

Ramalu and Subramanim (2019) surveyed expatriate academics who worked at 20 different universities in Malaysia to determine what relations, if any, existed between CQ, work engagement, and psychological need satisfaction. Ramalu and Subramanim operationalized work engagement by using the Utrecht Work Engagement scale developed by Schaufeli and Bakker (2003). The Utrecht Work Engagement scale has 17 items and measures 3 dimensions: vigor (6 items), dedication (5 items), and absorption (6 items). Ramalu and Subramanim measured CQ using the CQS and measured psychological needs satisfaction using the Need Satisfaction Scale from Deci et al. (2001), which assesses psychological satisfaction at work based on three psychological needs (autonomy, competence, and relatedness). The authors found a direct relation between CQ and personal needs satisfaction. Ramalu and Subramanim found both direct and indirect relations between CQ and work engagement. Specifically, they found that the relation between CQ and work engagement is mediated by psychological needs satisfaction. Ramalu and Subramanim's work demonstrates, as previously discussed, that some direct effects of CQ are also indirect effects. This is discussed further in the mediation section of this review. Ramalu and Subramanim explored the relations between CQ and phenomena for individuals who worked at universities; in contrast, Tu et al. (2019) investigated students.

Tu et al. (2019) investigated CQ's impact on sustainable career competitive advantage for university students studying design in Taiwan. The researchers used the CQS to measure CQ (Ang et al., 2007). The authors additionally developed a 10-item

questionnaire to measure competitive advantage by drawing on the literature and the input of eight experts in the field of design. The researchers found that motivational, metacognitive, and behavioral CQ were positively related to sustained competitive advantage. Thus, they argued, CQ is important for long-term competitive career advantage. Tu et al.'s study is similar to other studies discussed in this subsection because the results showed significant relations between CQ dimensions and performance outcomes in an academic environment as does Abdullah et al. (2020).

Abdullah et al. (2020) measured the direct impact of CQ dimensions on job satisfaction for lecturers and professors at twenty different university in Saudi Arabia, representing thirteen nationalities: Australian, British, Canadian, Egyptian, German, Jordanian, Malaysian, New Zealander, Nigerian, Pakistani, Indian, Tunisian, and American, with a partiality of respondents being from India (42.9%). The authors measured CQ using the CQS developed by Ang et al. (2007) and job satisfaction using the Minnesota Satisfaction Questionnaire (Weiss et al., 1967). Abdullah et al. found that latent CQ as well as cognitive, metacognitive, and motivational CQ positively affected job satisfaction, with cognitive CQ having the strongest effect.

Abdullah et al. (2020) argued that their findings reflected that CQ impacts expatriate instructors' ability to succeed while teaching in Saudi Arabia. Abdullah et al. focused on teachers whereas Alexandra et al. (2021) focused on students. Alexandra et al. researched latent CQ's impact on the perception of inclusion among students enrolled in undergraduate business courses; these were predominantly Caucasian Americans with prior work experience. The authors measured CQ using the CQS developed by Ang et al.

(2007) and perceived inclusion using six items adapted from Mor Barak's (2016) book. Alexandra et al. found that CQ is positively related to perceived inclusion. The authors argued that their findings reflect that hiring individuals with high CQ levels will improve feelings of inclusion in multicultural workgroups. The next subsection adds to the discussion CQ's s impact in nonacademic environments.

CQ's Effect on Performance Outcomes in Nonacademic Settings

Al-Shalabi et al. (2019) studied the relation between Jordanian bank employees' CQ levels and organizational capabilities in the nonacademic setting of Jordanian commercial Banks. The researchers measured CQ using the CQS (crediting a study conducted by Ahn and Ettner, 2013, as the source). Ahn and Etter (2013) credit the CQS to Ang et al. (2007). Al-Shalabi et al. measured organizational capabilities using the Organizational Capabilities Questionnaire developed by Al-Ajami (2012). Al-Shalabi et al. found that each of the four dimensions of CQ has a significant relation with organizational capabilities in Jordanian banks. The authors also found that CQ positively predicts technical, managerial, and marketing capabilities in Jordanian commercial banks. The researchers argued that CQ is thus important for banks in Jordan that want to realize their strategic goals and remain competitive in the global market. Al-Shalabi et al. argued that a limitation to their study was the narrow population (Jordanian bank employees) and recommend future researchers explore different populations, settings, and outcomes. Along these lines Sharma (2019) explored the relation between performance outcomes in a non-banking setting.

Sharma (2019) researched the effects of CQ on relationship quality and institutional success for mangers from Kompass, India, who worked at firms in three areas—Bangalore (South), Mumbai (West), and the National Capital Region (North)—and had at least two years of experience doing business with New Zealand. All of the managers had either an undergraduate or graduate college degree. Sharma measured CQ with the CQS developed by Ang et al. (2007). Sharma used The RELQUAL scale developed by Lages et al. (2005) and the B2B-RELPERF scale developed by Lages et al. (2008) to measure four aspects of relationship quality: trust, commitment, communication, and long-term orientation. Sharma measured institutional success by surveying the mangers on how effectively they managed differences in the nature and enforcement of rules, laws and regulations, cultural values, beliefs and norms, as well as ethical business practices as described in North (1990) and Peng et al. (2008).

Sharma (2019) found that cognitive and metacognitive CQ interacted, and their interaction had a positive and direct relation with relationship quality. The author also found that cognitive and metacognitive CQ's interaction did not have a significant relation with institutional success. However, Sharma found that metacognitive CQ individually did have a direct effect on intuitional success, whereas cognitive CQ on its own did not. These findings are discussed further in the section on interrelations between dimensions. Sharma found that motivational CQ had a positive and direct effect on both relationship quality and institutional success, but behavioral CQ did not. In addition to exploring direct effects, Sharma also considered the mediation of CQ, which in the present paper is examined in the section on the mediation of CQ. Sharma studied

interrelations as well as direct and indirect effects of CQ. In contrast, Soga did not study indirect effects but did study interrelations among CQ dimensions as well as direct effects.

Soga (2019) studied the direct effect of CQ dimensions on narcissism, export performance, and accuracy of export performance prediction. Soga also researched the interrelations among CQ dimensions, which is detailed with other studies involving the interrelation among CQ dimensions in the section on interrelations. The population used in Soga's research was employees of small- and medium-sized enterprises in Japan responsible for the international business of these firms. Soga measured CQ using the CQS developed by Ang et al. (2007), measured narcissism using the Narcissistic Personality Inventory developed by Konishi et al. (2006), and quantified export performance and accuracy of export performance prediction by export performance according to the actual export sales and the difference between the forecast and actual export sales, respectively.

Soga (2019) found positive and significant relations between narcissism and two dimensions of CQ (metacognitive and motivational). Soga argued that this reflects, in a Japanese context where self-esteem in generally low, that metacognitive CQ raises self-esteem to a healthy level. The author further explained that the positive relation between narcissism and motivational CQ establishes a relation between motivation and narcissism. The author explained that narcissists highly value performance outcomes and are highly motivated to look good, providing a theoretical basis for the observed relation between narcissism and motivational CQ. The author also found that motivational CQ

has a negative effect on export performance but a significant positive effect on export performance prediction. Soga posited that motivation does not always result in skilled behavior, as reflected in the difference between motivational CQ's relation with actual performance and prediction. Like Soga's study of the direct effect of CQ on performance outcomes, Vlajčić et al. (2019) studied effects on performance outcomes.

Vlajčić et al. (2019) studied the relation between CQ, conventional, and reverse knowledge transfer, and international experience among senior foreign managers who work for subsidiaries of foreign multinational companies that are active in Croatia. The subsidiaries were chosen to provide a cross-section of all such companies in terms of size. The authors explained that formally organized institutional knowledge transfer has two forms: conventional (from headquarters to subsidiary) and reverse (subsidiary to headquarters). The authors hypothesized that CQ would have a positive direct effect on both forms of knowledge transfer. The researchers measured CQ using the CQS developed by Ang et al. (2007). Vlajčić et al. operationalized a 7-item Likert scale to measure conventional and reverse knowledge transfer, drawing from the work of Yang et al. (2008) as well as Najafi-Tavani et al. (2012).

Vlajčić et al. (2019) found that each of the four dimensions of CQ had a positive and direct relation with conventional knowledge transfer, and three CQ dimensions (metacognitive, motivational, and behavioral) had positive and direct relations with reverse knowledge transfer. The authors argued that these findings demonstrate the significance and importance of the impact of CQ on both forms of formally organized institutional knowledge transfer. To better understand whether international experience

affects CQ's relations with both forms of knowledge transfer, the researchers also tested for moderation. The authors found no evidence that international experience moderates the relations between CQ and knowledge transfer. In a similar, but more narrowly focused study, Naushad and Majid (2020) examined only direct effects.

Naushad and Majid (2020) researched the effect of CQ on job performance for expatriates living in Pakistan on international work assignment. Naushad and Majid measured CQ using the CQS. Naushad and Majid measured task performance using the Expatriate Task Performance Scale developed and validated by Black and Porter (1991). Naushad and Majid measured assignment-specific performance with the Expatriate Assignment Specific Performance Scale developed by Caligiuri (1997). Naushad and Majid measured the contextual performance of expatriate employees using the Contextual Performance Scale developed by Caligiuri .

Naushad and Majid (2020) found cognitive, metacognitive, and behavioral CQ to each be directly and positively related to contextual performance. The authors also found that latent CQ was positively related to job performance and that motivational and behavioral CQ were positively related to job performance. The researchers found (a) that behavioral CQ was directly and positively related to contextual and assignment-specific performance; (b) that latent CQ could not be shown to be related to task performance; and (c) that latent CQ was positively related to contextual and assignment-specific performance. Naushad and Majid argued that their results demonstrate the importance of CQ for the performance of employees on overseas work assignments. The authors argued that their research will help mangers in the selection and development of employees for

overseas work assignments, stating that there is a need for training focused on developing motivational and behavioral CQ because these two dimensions were most closely related to effectiveness. Porkodi et al. (2022) moved the study of CQ from the business setting to a medial one.

Porkodi et al. (2022) investigated the relation between the four dimensions of CQ and patient care in a private hospital in Muscat governorate. Patient care and CQ were assessed in a hybrid questionnaire that included the CQS (Ang & Van Dyne, 2006) with an additional to questions. Some question on the CQS were modified to fit the dynamic of patient care. Porkodi et al. did not give any examples of the modified questions. The authors survey 144 nurses. The researchers found that most nurses scored high to moderate for all cognitive, metacognitive, motivational, and low for behavioral and moderate for latent CQ. The authors found a high correlation between patient care and nurses CQ. These findings support my argument that there is a gap in the literature regarding how and when CQ effects occur, because Porkodi et al. do not account for the variation in scores for the four dimensions and laten CQ. The authors did argue that their research demonstrates how important CQ is for patient care and services.

The authors in this section, like Porkodi et al. (2022) and Ang et al. (2007), have demonstrated through various studies that CQ has a positive and direct effect on performance in non-academic settings. CQ has also been shown to have a direct and positive effect on performance in academic settings (see, for example Ramalu & Subramanim, 2019; Tu et al., 2019). Ang et al.'s finding that CQ is positively related to wellbeing and adjustment was also supported by Mehra and Tung (2017). CQ's direct

relations with antecedents and outcomes that are also mediated and moderated (Alexandra, 2018b; Alexandra et al., 2021).

Mediation and Moderation of CQ Relations with Phenomena

The researchers included in this section studied the mediation and moderation of CQ effects by other phenomena. The mediation and moderation of CQ effects by other phenomena detail which phenomena create underlying processes that strengthen or weaken relations (Sharma, 2019). This section of the literature review is divided into two subsections: mediation of CQ's relations with phenomena; and moderation of CQ's relations with phenomena. In the first subsection on mediation, I begin by discussing Lorenz et al.'s (2018) findings.

Mediation of CQ Relations with Phenomena

Lorenz et al.'s (2018) mixed-method research investigated the relations among CQ, innovativeness, and international opportunity recognition. The authors conducted the study in two parts. The first was a quantitative investigation of whether cognitive and metacognitive CQ individually had positive relations with expatriates' ability to recognize international opportunities. The authors also sought to determine whether the ability to recognize international opportunities mediated the relations between cognitive and metacognitive CQ and innovativeness. The authors explained that innovativeness consists of effort, flexibility, risk- taking, courage, and intrinsic motivation.

Lorenz et al. (2018) found, in the quantitative part of their study, that both cognitive and metacognitive CQ were significantly related to international opportunity recognition. The authors found that international opportunity recognition was positively

related to innovation and that international opportunity recognition mediated both cognitive and metacognitive CQ's relations with innovativeness. Specifically, mediation by international opportunity recognition strengthened the relations with cognitive and metacognitive CQ. The authors used structural equation modeling to find mediation. To validate the found mediation effects, Lorenz et al. used Hayes' (2018) PROCESS plug in for IBM SPSS. To further support their findings, the researchers conducted a second, qualitive examination. Lorenz et al.'s qualitative research confirmed that learning (cognitive CQ), and cross-cultural competences (metacognitive CQ) are both important aspects of international opportunity recognition and innovativeness.

Lorenz et al. (2018) argued that their findings demonstrate the importance of cognitive and metacognitive CQ with relation to corporate innovation via the ability of employees to recognize and capitalize on opportunities. Alexandra (2018a) had a different focus and investigated the relation between CQ, propensity to change, and social dominance orientation. The author argued that an individual's ability to modify or change their beliefs in stereotypes (propensity to change stereotypes) would mediate the relation between an individual's buy-in to social hierarchies that place cultures in dominant and subordinate roles (social dominance orientation), and CQ development after cross-cultural contact. Alexandra found that social distance orientation was negatively related to propensity to change stereotypes and CQ development. The author also found that propensity to change stereotypes was positively related to the development of three CQ dimensions (metacognitive, motivational, and behavioral). The researcher also tested the

mediating effects of propensity to change stereotypes on the relation between social dominance orientation and each of the four dimensions of CQ.

Alexandra (2018a) also found that propensity to change stereotypes mediates the relation between social dominance orientation and metacognitive, motivational, and behavioral CQ. Additionally, Alexandra found that social dominance orientation has only an indirect effect on three CQ dimensions (metacognitive, motivational, and behavioral) and did not find a relation with cognitive CQ. The author did not discuss the implications of a lack of relation between propensity to change stereotypes, social distance orientation, and cognitive CQ, nor did they speculate no relation was evident. The author explained that their study provides insights into individual differences regarding CQ training outcomes and expands the exploration of CQ antecedents beyond personality and international experience. Alexandra (2018b) continued the exploration of the mediation of CQ's relation with phenomena by investigating the mediating effects of perceived disconfirmation on the relation between social complexity belief and CQ development.

Alexandra (2018b) explained that social complexity belief is a macro-level or general understanding of how the world works, and disconfirmation occurs when those beliefs are proven wrong. The author stated that disconfirmation can have positive effects in cross-cultural interactions if the individual is perceptive enough to realize that their cultural expectations have resulted in behavior that did not fit the culture of context and then adapts their behavior. As discussed in the antecedents of CQ section of the present review, Alexandra found perception of disconfirmation is an antecedent of CQ.

Alexandra also found that social complexity belief is significantly related to perception of disconfirmation.

Additionally, Alexandra (2018b) found that social complexity belief mediates the relation between perception of disconfirmation and each of the four dimensions of CQ as well as the latent CQ construct. The author argued that their work provides a deeper understanding of how cultural differences impact CQ training outcomes. The author explained that social complexity belief and perception of disconfirmation are both shaped by individual culture and, therefore, individuals are expected to have varying levels of both, which would impact CQ training outcomes. Alexandra studied the mediation of an antecedent relation and CQ; in contrast, Rockstuhl and Van Dyne (2018) studied the mediation of CQ's relation with outcomes.

Rockstuhl and Van Dyne (2018) investigated whether intercultural judgment and decision mediated the positive effects of two dimensions of CQ (metacognitive and cognitive) on intercultural performance. The authors also tested whether sociocultural adjustment mediated the positive relation of motivational CQ and behavioral CQ on the performance on observer-related tasks. Rockstuhl and Van Dyne used the bi-factor model of CQ to test two hypotheses: full mediation and partial mediation. As discussed in the direct effects of CQ section and throughout this review, the researchers validated a bi-factor model of CQ, confirming that CQ is both a latent construct and four autonomous dimensions (cognitive, metacognitive, motivational, and behavioral).

Rockstuhl and Van Dyne (2018) found that intercultural judgment and decision making partially mediated the positive effects of metacognitive CQ and cognitive CQ on

intercultural performance. The authors also found that sociocultural adjustment fully mediated the positive relation between motivational CQ and observer-related task performance. The authors found that behavioral CQ's direct relation with observer-related task performance was not mediated. These findings are part of a larger metanalysis designed to build knowledge about CQ's nomological network. Because of this, the implications of their findings are discussed more fully in the section of the present review focused on higher-order relations and interrelations of CQ dimensions. Rockstuhl and Van Dyne (2018) focused on mediation of CQ's relation with outcomes whereas Lin and Shen (2019) focused on the mediation of some antecedents' relations with CQ.

Lin and Shen (2019) found that the quality of intercultural contact impacted the development of CQ, and that informal intercultural contact was most impactful. The authors explained that this is because informal contacts are driven by shared interests in a relaxed atmosphere, which reduces frustration. Lin and Shen argued that intercultural anxiety will negatively impact the relation between intercultural contact and CQ development. The authors explained that intercultural anxiety is caused by the expectation that intercultural contact will have negative outcomes based on beliefs in stereotypes, which create prejudice. The authors hypothesized that intercultural anxiety would negatively mediate the relation between intercultural contacts and the development of the four dimensions of CQ. Lin and Shen found that intercultural anxiety mediated only the relation between informal intercultural contact and metacognitive CQ.

Lin and Shen (2019) argued that a reduction in intergroup anxiety reduces cognitive depletion caused by over-attention to biases and allows for higher-order intellectual processing (metacognition), which explains the mediating effect. The authors stated that this result implies that formal intercultural contacts do not increase intercultural anxiety. The authors also argued that their results indicate that intercultural anxiety does not impede the development of cognitive, motivational, or behavioral CQ. The authors stated that reducing intercultural anxiety reduces negative stereotypes, cognitive depletion, and prejudice. Lin and Shen explained that their research demonstrated that informal intercultural contact reduces intercultural anxiety.

Sharma (2019) researched the relations among CQ, relationship quality, and intuitional success. The researcher examined several mediation effects such as complementary, competitive, and indirect-only. The author explained complementary and competitive mediation as follows: complementary mediation occurs when direct and mediating effects are significant, and competitive mediation occurs when direct and meditating effects point in opposite directions. The researcher described indirect-only mediation as occurring when only the indirect effects are significant. Sharma found that relationship quality has a complementary mediating effect on the interaction effects of cognitive and motivational CQ on institutional success. The author found that relationship quality has a complementary mediation effect on the relation between metacognitive CQ and institutional success. The researcher found that relationship quality has a direct-only mediation effect on the relation between motivational CQ and institutional success but did not find a mediated relation between behavioral CQ and

institutional success. The implications of Sharma's work are discussed in the section on the interrelations of CQ dimensions.

In this subsection, the mediation of CQ effects was discussed.. Lorenz et al. (2018) found that international opportunity recognition (a type of motivation) mediated both cognitive and metacognitive CQs' relations with innovativeness (a type of behavior), which partially supports my argument that motivational CQ may mediate the relation between cognitive and behavioral CQ. In support of my argument that metacognitive CQ may have a serial mediation or parallel mediation relation with motivational CQ, Alexandra (2018a) found that propensity to change stereotypes (a form of metacognition) mediates the relation between social dominance orientation and three dimensions of CQ (metacognitive, motivational, and behavioral). Although Alexandra did not explore the potential for serial mediation, the finding that a type of metacognition (propensity to change stereotypes) mediated motivational CQ's effects on outcomes is suggestive of the potential for serial or parallel mediation to exist. This possibility is also directly suggested by Racicot and Ferry (2016) as discussed in the interrelations between dimensions section of this review.

Alexandra's (2018b) findings that social complexity belief mediates the relation between perception of disconfirmation and each of the four dimensions of CQ and latent CQ demonstrated the mediation of individual dimensions and of the latent construct independently of each other, which provides support for the bi-factor model of CQ used in my research and validated by Rockstuhl and Van Dyne (2018). The work of Rockstuhl and Van Dyne provides much of the foundation for my own work (beyond the validation

of the bi-factor model of CQ); this has been discussed throughout and will revisited in the higher-order relations section of this review. Jyoti and Kour (2017) in addition to finding mediation of CQ's effects on phenomena, also found moderation of CQ's effects on phenomena.

Moderators of CQ Relations with Phenomena

Gabel-Shemueli et al. (2019) investigated the moderating effect of idiocentrism–allocentrism on the relation between CQ and employee engagement. The authors explained that idiocentrism is the focus on self, personal viewpoint, and one's goals as well as self-reliance; in contrast, allocentrism is the focus on others, their viewpoints, and their goals as well as giving and receiving support from others. The authors measured idiocentrism–allocentrism with a scale developed by Dorfman and Howell (1988) and CQ using the CQS developed by Ang et al. (2007). Gabel-Shemueli et al. also investigated whether employees' perceptions of organizational adaptability moderated the relation between CQ and employee engagement as well as whether employees' individual perception of organizational involvement moderated the relation between CQ and employee engagement.

Gabel-Shemueli et al. (2019) measured engagement with the short version of the Utrecht Work Engagement Scale found in Schaufeli et ai. (2002), and measured employee perception of organizational adaptability and involvement with the Denison Organizational Culture Survey developed by Denison and Neale (2000). Before testing for moderation, Gabel-Shemueli et al. investigated whether there was a direct relation between CQ and employee engagement for English- (46.1%) and Spanish- (53.9%)

speaking employees of a multinational geophysical services company representing countries from around the world (Peru, 26%; Colombia, 20.5%; USA, 20%; Canada, 16%; Bolivia, 9.1%; Malaysia, 4.1%; Brazil, 1.8%; and other countries 2.5%). The authors found that CQ has a direct positive relation with employee engagement.

Gabel-Shemueli et al. (2019) found that CQ's relation with employee engagement was moderated by idiocentrism–allocentrism such that the relation between CQ and employee engagement was stronger for those with an allocentric orientation and weaker for those with an idiocentric orientation. The researchers explain that this demonstrated that allocentric orientation strengthens CQ's effects on employee engagement. Gabel-Shemueli et al. found that perceived organizational involvement did not moderate the relation between CQ and employee engagement, but perceived adaptability did. The authors explained that these results demonstrated that high perceived adaptability strengthens the relation between CQ and employee engagement.

Gabel-Shemueli et al. (2019) focused on the role of allocentric and idocentric orientations in the moderation of CQ relations. In contrast, Alexandra et al. (2021) investigated perceived diversity as a moderator. As discussed in the direct effects section, Alexandra et al. found that (a) CQ is positively related to perceived inclusion; (b) perceived inclusion is an antecedent to CQ development; and (c) the relation between CQ and perceived inclusion is not moderated by perceived level of cultural diversity in the workplace, but the relation between perceived inclusion and CQ development is moderated by perceived cultural diversity, being stronger for individuals who perceive higher levels of cultural diversity in their workgroup. The researchers measured cultural

diversity by asking respondents whether the ethnicity/race composition in their workgroup was “either not at all or a bit diverse”, “somewhat diverse”, or “extremely diverse.” The authors argued that their findings reflect the importance of perceptions of inclusion and diversity in the workplace for the development of CQ and stated that the dynamic between the individual and workgroup perceptions warrant more research. Alexandra et al. stated that their definition of diversity should be expanded because they limited such considerations to ethnicity and race.

Alexandra et al.’s (2021) research demonstrated that CQ has direct and indirect (moderated) relations with antecedents. This is also true for CQ and mediation (Mehra & Tung, 2017). Understanding the mediation and moderation of CQ’s relations with phenomena provides insights into “how” and “when” such relations impact variations in educational, professional, interpersonal, and training outcomes by revealing what underlying processes are affecting the relations with CQ (Alexandra, 2018a; Alexandra et al., 2021; Lorenz et al., 2018;). Understanding how to develop CQ is important because CQ impacts wellbeing and ability to succeed (Mehra & Tung, 2017; Sharma, 2019). Jyoti and Kour (2017) and Gabel-Shemueli et al. (2019) demonstrated that latent CQ’s relation with outcomes is moderated. Further, Alexandra et al. added to the literature about the boundary conditions of CQ’s relations with outcomes and antecedents. Exploring CQ as a mediator/moderator in the next section will further add to the discussion of what is known about CQ relations and their boundary conditions (Rockstuhl & Van Dyne, 2018).

CQ as a Mediator and as Moderator of the Relations Between Phenomena

Both latent and individual dimensions of cultural intelligence (CQ) mediated and moderated relations among cross-cultural phenomena (Caputo et al., 2018; Dogra & Dixit, 2019;). Research into the mediating and moderating effects of individual dimensions and latent CQ provides insights into how and when the construct impacts outcomes and provides insights into the validity of the bifactor model of CQ (Korzilius et al., 2017; Pawlicka et al., 2019; Rockstuhl & Van Dyne, 2018;). My research focuses on the CQ dimensions mediation and moderation of the interrelations of dimensions whereas the researchers included in this section focus on CQ as a mediator and moderator of the relations between phenomena. As previously discussed, Rockstuhl and Van Dyne (2018) validated the findings of Ang et al. (2007) supporting the four-dimension model of CQ.

Rockstuhl and Van Dyne (2018) found a bifactor model in which the four dimensions of CQ (cognitive, metacognitive, motivational, and behavioral) are autonomous and combine to create latent CQ, also supporting Ang et al. (2007). Rockstuhl and Van Dyne found the bi-factor model had a stronger quantitative foundation than Thomas et al.'s (2015) three-dimension model, which excluded motivation as a dimension. Further supporting motivation as a dimension Pawlicka et al. (2019) found that motivational CQ mediates the relation between cross-cultural outcomes. Korzilius et al.'s (2017) work supported the argument that CQ comprises four induvial autonomous dimensions and a latent construct, as suggested in Ang et al. and demonstrated in Rockstuhl and Van Dyne.

Korzilius et al. (2017) found that each of the four dimensions and latent CQ mediated relations between cross-cultural outcomes. Awan et al. (2018a), in discussing the ability of CQ dimensions to moderate relations, argued that their investigation revealed the ability of CQ to amplify prosocial outcomes, even when political dynamics were uncertain. If this argument is accepted, the construct is socially important. Understanding CQ's effects as a mediator and moderator can provide insights into the impact of the individual dimensions and latent CQ on phenomena (Korzilius et al., 2017; Rockstuhl & Van Dyne, 2019). To better elucidate CQ's ability to create effects, this section of the review is divided into two subsections and begins with a discussion of the work of researchers who investigated CQ as a mediator of the relations between phenomena followed by the work of those who investigated CQ as a moderator of the relations between phenomena.

CQ as a Mediator of the Relations Between Phenomena

Korzilius et al. (2017) investigated the relations among multiculturalism, innovative work behavior, all four dimensions of CQ, and latent CQ. The authors measured multiculturalism by asking participants, "How would you label yourself in terms of your cultural background?" The participants were employees of a Dutch international staffing company; 42.0% of participants rated themselves monocultural, 12.7% bicultural, and 45.2% multicultural. Because of the low frequency of bicultural employees, the researchers combined this category with the multicultural category, resulting in a dichotomous variable for multiculturalism. The authors measured individual dimensions of CQ and latent CQ using the CQS developed by Ang et al.

(2007). Rockstuhl and Van Dyne (2018) validated each of the four dimensions of CQ (cognitive, metacognitive, motivational, and behavioral) and latent CQ, which is the effect of all four dimensions combined into a single dimension. Rockstuhl and Van Dyne explained that this is different than aggregate CQ because latent CQ is not simply the sum of the scores of the four dimensions but is a unique dimension created by interactions among dimensions. Rockstuhl and Van Dyne's work is discussed more fully in the section on the interaction between dimensions. To measure innovative work behavior, Korzilius et al. took sixteen items from an instrument by De Jong and Den Hartog (2010). Korzilius et al. explained that innovative work behavior is the introduction of new technologies, work structures, products, or any other novel organizational change focused on improving effectiveness.

Korzilius et al. (2017) found that multiculturalism had a small positive relation with innovative work behavior and a medium-sized positive relation with latent CQ. The authors found that latent CQ had a medium- to large-sized positive relation with innovative work behavior. The researchers also found that there is no direct relation between multiculturalism and innovative work behavior, but a significant positive indirect relation is seen when fully mediated by latent CQ, and this relation is stronger when latent CQ is high. Korzilius et al. also tested whether each individual domain mediated the relation between multiculturalism and innovative work behavior. They found that all four dimensions had a significant full mediating effect. The authors argued that their findings reflect that all four dimensions and latent CQ contribute to an

individual's ability to break away from individual cultural schemas in favor of integrating multiple cultural identities.

Korzilius et al. (2017) argued that a limitation to their study was defining culture based on national identity and countries of residence. Although this is a standard way of defining culture, it is not the most inclusive method. More inclusive definitions of culture include dimensions that influence personal culture and do not assume socioeconomic background, cultural norms, beliefs, and values are uniform across national identities (Roux & Suzuki, 2017). Kanchanaprapas (2019), like Korzilius et al., viewed culture through the lens of ethnicity, reporting most of their participants were Asian (55.8%).

Kanchanaprapas (2019) stated that their participants were international students in both diploma and non-diploma programs at a university in Taiwan. The author quantitatively studied the relation between Mandarin-language ability, sociocultural adaptation, and CQ. The author asked respondents to rate their Mandarin language ability on scale from 0 to 5, with 0 being "no competence" and 5 being "near native fluent." The author measured CQ using the CQS developed and validated by Ang et al. (2007). The researcher measured sociocultural adaption using the sociocultural adaptation scale from Ward and Kennedy (1999). The author explained that the sociocultural adaptation scale measures academic adaptation, survival adaptation, and interpersonal adaptation.

Kanchanaprapas (2019) stated that sociocultural adaptation is the ability to function in social settings such that the individual feels comfortable and able to carry out routines and activities necessary for meeting school commitments in and out of the classroom (academic adaptation), daily functioning such as shopping and dealing with

bureaucracy (survival adaptation), as well as achieving interpersonal goals and making friends (interpersonal adaptation). The researcher noted that the participants all had high levels of metacognitive, motivational, and behavioral CQ. The author interpreted the participants' low cognitive CQ as reflecting international students' lack of knowledge regarding country-specific rules and regulations. The author used correlation analysis to test the strength of the relations among Mandarin-language ability, sociocultural adaptation, and CQ.

Kanchanaprapas (2019) found that Mandarin-language ability has a positive direct relation with CQ. The researcher argued that this finding supports the argument that language and culture are related. Similarly, the author found that Mandarin-language ability has a positive direct relation with sociocultural adjustment and argued that this provides further support for a language–culture relation. The author tested the relation between CQ and sociocultural adjustment and found a direct and positive relation. This is asserted by the researcher to support the findings of Ang et al. The author then used multiple linear regression to test for mediating effects. Kanchanaprapas found that CQ partially mediates the relation between Mandarin-language ability and sociocultural adaptation, which indicates that higher CQ allows Mandarin-language ability to be more effectively applied to sociocultural adaptation. Kanchanaprapas investigated latent CQ as a mediator, whereas Pawlicka et al. (2019) investigated individual dimensions as possible mediators.

Pawlicka et al. (2019) measured the relations among all four dimensions of CQ (cognitive, metacognitive, motivational, and behavioral), three dimensions of empathy

(emotional empathy/empathetic concern, emotional empathy/personal distress, and cognitive empathy/perspective), and social closeness. As discussed in the direct effects section, the authors used the CQS developed Ang et al. (2007) to measure CQ, the inverted Social Distance Scale (Bogardus, 1928) and the Feeling Thermometer (Lupton & Jacoby, 2016) to measure social closeness, the Polish version of the Davis scale developed by Konrath, Meier, and Bushman (2018) to measure empathy, and the Empathic Sensitiveness Scale developed by Kazmierczak et al. (2007) to measure three dimensions of empathy: emotional empathy/empathetic concern, emotional empathy/personal distress, and cognitive empathy/perspective taking. Pawlicka et al. stated that emotional empathy/empathetic concern is understanding and caring about others' suffering, emotional empathy/personal distress is feeling the perceived stress of others, and cognitive empathy/perspective taking is trying to view things from others' perspectives. The authors explained that trait empathy includes emotional empathy/personal distress and cognitive empathy/perspective taking.

Pawlicka et al. (2019) stated the combination of emotional empathy/empathetic concern and cognitive empathy/perspective can be considered "other-oriented empathy." They used Hayes' (2013) PROCESS method to test whether latent CQ and each of the four CQ dimensions individually mediated the relation between empathy and social closeness. The authors found that metacognitive and motivational CQ mediated the relation between emotional empathy/empathetic concern and social closeness. The authors found that motivational CQ mediated the relation between perspective taking and social closeness. The authors found that motivational CQ also

mediated the relation between two forms of empathy (self-oriented emotional empathy/personal distress empathy) and social closeness.

Pawlicka et al. (2019) explained that motivational CQ's relations strengthen the relation between empathy and social closeness, demonstrating that this domain of CQ reduces resistance to exploring new cultures and welcoming individuals from cultures different than one's own. The authors argued that both metacognitive and motivational CQ reduce Islamophobia, as evidenced by increased social closeness between Polish nationals and Muslim Syrian refugees. The authors argued that their research demonstrated the importance of motivational CQ because of the domain's role in reducing cross-cultural fear and anxiety via the reduction of distance felt between cultures. The authors also stated that their research demonstrated the importance of latent CQ in reducing cross-cultural prejudice by reducing feeling of inter-cultural distance, and this reduction fosters community building and unity. Dogra and Dixit (2019), like Pawlicka et al., tested for the mediating effects of all four dimensions of CQ.

Dogra and Dixit (2019) examined whether the individual dimensions of CQ mediated the relation between conflict and innovation. Dogra and Dixit divided conflict into four subgroups: task (Jehn & Mannix, 2001), relationship (Jehn & Mannix, 2001), process (Jehn, Northcraft, & Neale, 1999), and status (Bendersky & Hays, 2012). Dogra and Dixit stated that task conflict occurs when group members disagree about how best to complete work tasks, relationship conflict occurs when group members do not like each other, process conflict occurs when group members do not agree on how to accomplish

goals, and status conflict occurs when group members do not respect or acknowledge that each member has a specific role. Dogra and Dixit measured CQ using the CQS developed by Ang et al. (2007) and innovation by drawing from West and Farr (1989), explaining that innovation is demonstrated by individuals in the company working to improve corporate outcomes.

Dogra and Dixit's (2019) metanalysis includes literature written in English about CQ and published between 2003 and 2017, about conflict and published between 1995 and 2017, and about innovation and published between 1989 and 2017. The authors found a direct relation between the leader's CQ and innovation. The researchers found that metacognitive CQ has a positive relation with innovation. The authors also found that cognitive CQ has a positive relation with innovation and a positive mediating effect on the direct relation between task conflict and innovation. Furthermore, the authors found that motivational CQ has a positive relation with innovation and a positive mediating effect on the direct relations between each of the four forms of conflict and innovation. Finally, the researchers found that behavioral CQ has a positive relation with innovation and positively mediated the direct relations between all four types of conflict and innovation. Dogra and Dixit argued that their work demonstrated that CQ magnifies positive outcomes and because of the construct's importance more research to deepen the understanding CQ is warranted. Dogra and Dixit investigated CQ at the team level and performance outcomes, as do Pandey and Lucktong (2020).

Pandey and Lucktong (2020) investigated the impact of the relations among CQ, business-to-business selling, and social-media usage intensity for cross-cultural sales

between businesses in India and Thailand. The authors developed the "intensity of social media use for B2B selling scale" to measure business-to-business sales and intensity of social-media usage and developed the "cross-cultural sales performance" scale to measure cross-cultural sales. Pandey and Lucktong explained that in the final version of the intensity of social-media use for B2B selling scale, there were seven questions that were developed by asking salespeople about how frequently they used social media for the purpose of supporting business-to-business sales activities, which included the distribution of products. The authors explained that cross-cultural sales performance was measured by using five questions focused on the ability of salespeople to sell to Indian distributors and develop long-term relationships with distributors in India. The authors used the CQS developed by Ang et al. (2007) to measure CQ; adaptive selling behavior was measured using the five ADAPTS scale items developed by Spiro and Weitz (1990); and customer-oriented selling behavior was measured using five of the ten subcategories of the Selling-Orientation–Customer-Orientation Scale items created by Saxe and Weitz (1982).

Pandey and Lucktong (2020) found a positive relation between intensity of social-media usage by salespeople and business-to-business cross-cultural sales. The authors found a positive relation between salesperson CQ and cross-cultural sales performance. Pandey and Lucktong found a positive relation between social-media usage intensity for business-to-business selling and customer-oriented selling behavior. The researchers found a positive relation between salespeople's usage of social media for business-to-business selling and CQ. The authors used indirect effects analysis and total effects

analysis, as provided in WarpPLS 6.0 (Kock, 2015), to test for mediation and found that CQ positively mediated the relation between social-media usage intensity for business-to-business selling and cross-cultural sales performance. The authors argued that their work demonstrated that CQ provides the cross-cultural competency necessary to effectively use social media to improve business-to-business selling. The authors also argued that CQ promotes the ability to effectively build the cross-culture relationships necessary to be successful in business-to-business sales between countries.

The works included in this subsection, such as Korzilius et al. (2017) support my work, finding that all four dimensions had significant full mediating effects on the relation between multiculturalism and innovative work behavior. The researchers demonstrated that each of the dimensions can fully mediate relations, supporting my research into the possible partial and full mediation of the relation between cognitive and behavioral CQ by motivational and metacognitive CQ.

Kanchanaprapas (2019) further supported my research by providing additional evidence supporting Ang et al.'s (2007) findings that there is a positive direct relation between CQ and sociocultural adjustment. Ang et al. provided a foundation for my research by validating the four-dimension (cognitive, metacognitive, motivational, and behavioral) model of CQ as well as developing and validating the Cultural Intelligence Scale (CQS). Both the model and the CQS were central to my research. I tested the relations between the four dimensions as described by Ang et al. and measured them using the CQS. Ang et al. argued that one outcome of CQ is improved intercultural relations, and Pawlicka et al. (2019) support this argument by finding that motivational

CQ positively mediates the relation between perspective taking and social closeness and the relation between two forms of empathy (self-oriented emotional empathy/personal distress empathy), with this mediation strengthening the relation between empathy and social closeness. Additionally, the authors found that metacognitive and motivational CQ mediated the relation between emotional empathy/empathetic concern and social closeness. The authors' findings strengthen the argument for the inclusion of motivation as a dimension and for the four-dimension model. The authors demonstrated that both metacognitive and motivational CQ reduced Islamophobia, as evidenced by metacognitive and motivational CQ being associated with increased social closeness between Polish nationals and Muslim Syrian refugees, a result that significantly contributes to positive social change.

Dogra and Dixit's (2019) work further supported the argument for the inclusion of motivational CQ, finding that motivational CQ has a positive relation with innovation and a positive mediating effect on the direct relations between conflict and innovation. The authors also demonstrated that both latent CQ and individual dimensions of CQ contribute to positive social and work outcomes: a leader's latent CQ predicts innovation, metacognitive CQ has a positive relation with innovation, cognitive CQ has a positive relation with innovation and a mediating effect on the direct relation between task conflict and innovation, and behavioral CQ has a positive relation with innovation and mediates the direct relations between conflict and innovation. Further supporting the argument that CQ has positive effects in the workplace, Pandey and Lucktong (2020) argued that their findings that CQ positively mediated the relation between social-media

usage intensity for business-to-business selling and cross-cultural sales performance demonstrated that CQ provides the cross-cultural competency necessary to effectively use social media to improve business-to-business selling. The authors in this section supported my research (Kanchanaprapas, 2019; Korzilius et al., 2017) and demonstrated the CQ construct's ability to contribute to positive social change (Dogra & Dixit, 2019; Pandey & Lucktong, 2020; Pawlicka et al., 2019;). Haniefa and Riani's (2019) exploration of CQ as a moderator supports the argument that CQ contributes to positive social change, and Chua and Ng's (2017) results support my argument for testing CQ dimensions as moderators.

CQ as a Moderator of the Relations Between Phenomena

Chua and Ng (2017) examined the relations among cognitive CQ, metacognitive CQ, and creativity for business students from fifteen countries (Australia, Belgium, Canada, China, Czech Republic, Germany, India, the Netherlands, Norway, Russia, Spain, Sweden, Switzerland, Ukraine, and the United States) studying in Singapore. The researchers used ten items from the CQS developed by Ang et al. (2007) to measure cognitive and metacognitive CQ. Chua and Ng measured creativity with five items from Zhou and George's (2001) instrument. The authors found that cognitive CQ has an inverted U-shape relation with creativity. This relation is moderated by metacognitive CQ such that the relation between cognitive CQ and creativity is seen only for those with low metacognitive CQ. Chua and Ng's work thus demonstrated that metacognitive CQ moderates cognitive CQ's relation with behavioral outcomes, which supports my investigation into metacognitive CQ's ability to moderate the relation between cognitive

CQ and behavioral CQ. Another aspect of my research is the focus on the importance of CQ's relation with outcomes that affect corporate performance, such as knowledge hiding/sharing. Knowledge hiding/sharing is important because failure to knowledge-share cost multinational corporations estimated at $31.6 billion annually (Vlajčić et al., 2019).

Bogilović et al. (2017) explained that there are three types of knowledge hiding that inhibit knowledge-sharing: playing dumb, rationalized hiding, and evasive hiding. The authors stated that playing dumb entails pretending not to possess knowledge, rationalized hiding is the systematic rationalization of why knowledge hiding is the appropriate choice, and evasive knowledge hiding is falsely stating that there is an intention of knowledge-sharing. The researchers argued that knowledge hiding negatively impacts creativity. Bogilović et al. investigated the relations between knowledge hiding, creativity, and CQ for individuals employed in the fields of pharmaceuticals, information technology, automobiles, and biotechnology, with participants from eight countries (Croatia: 16.5%; Italy: 14.4%; Bosnia and Herzegovina: 13.9%; Albania: 12.6%; Slovenia: 12.7%; Montenegro: 12.1%; Greece: 9.4%; and Serbia: 8.5%). To measure knowledge hiding, Bogilović et al. used six items from Connelly et al. (2012); creativity was measured with thirteen items from Zhou and George (2001); and CQ was measured with sixteen items from Ang and Van Dyne's (2008) CQS, which has the same items as the CQS in Ang et al. (2007).

Bogilović et al. (2017) found that knowledge hiding has a direct negative effect on creativity and that CQ has a direct positive effect on creativity. The researchers found

that CQ moderates the relation between knowledge hiding and creativity such that high CQ reduces negativity in the relation between knowledge hiding and creativity. Bogilović et al. conducted a second quantitative study, and the results supported their original findings. Bogilović et al. investigated latent CQ as a moderator, whereas Şahin and Gürbüz (2017) investigated the moderating effects of individual dimensions.

Şahin and Gürbüz (2017) investigated the relations among entrepreneurial orientation, international performance, and the four dimensions of CQ (cognitive, metacognitive, motivational, and behavioral). The authors explained that entrepreneurial orientation drives individuals to enact changes that they believe will result in an advantage over their competitors and to be willing to take risks for their vision to be realized. The authors investigated whether the four dimensions of CQ moderated the relation between entrepreneurial orientation and international performance for employees of small firms in the central Anatolia region of Turkey. Şahin and Gürbüz measured entrepreneurial orientation with the entrepreneurial orientation Questionnaire (Covin & Slevin, 1989) and CQ using the CQS (Ang et al., 2007). The authors measured "similarity to the ideal configuration" for managers, which was defined as their latent CQ scores. The higher a manager's CQ score, the closer they are to the "ideal configuration." To measure the firms' international performance, Şahin and Gürbüz developed a scale to measure the following performance outcomes: sales level, market share, return on investment, profitability, and overall satisfaction with performance.

Şahin and Gürbüz (2017) found that all four CQ dimensions individually as well as latent CQ had a positive and significant relation with international performance. The

researchers found that entrepreneurial orientation had a positive relation with international performance. The authors tested for moderation via hierarchical moderated regression analysis (Cohen & Cohen, 1983). The researchers found that three of the four dimensions (cognitive, metacognitive, and motivational) positively moderated the relation between entrepreneurial orientation and international performance such that the relation was strengthened for managers with high cognitive, metacognitive, and motivation CQ individually and negated for managers with low levels of the three dimensions. The authors found that behavioral CQ did not have a moderating effect; however, latent CQ did strengthen the relation between entrepreneurial orientation and international performance. When latent CQ was low, the relation between entrepreneurial orientation and international performance became non-significant.

Şahin and Gürbüz's (2017) work supports Rockstuhl and Van Dyne's (2018) argument that a bi-factor model of CQ, in which there are four independent autonomous dimensions and a latent construct comprising all four dimensions, by demonstrating that three dimensions (cognitive, metacognitive, motivational) and latent CQ act as moderators. Şahin and Gürbüz's work also supports Ang et al.'s (2007) argument for the inclusion of motivational CQ by demonstrating that this domain acts as an autonomous positive moderator of the relation between entrepreneurial orientation and international performance. Caputo et al. (2018) like Şahin and Gürbüz , investigated the effects of individual dimensions.

Caputo et al. (2018) researched the relations among CQ dimensions, five cultural orientations (collectivism, long-term orientation, masculinity, power distance, and

uncertainty avoidance), and three conflict-management styles (avoiding style, forcing style, and problem-solving style) for employed non-student individuals who were surveyed via the Internet. The authors measured five aspects of cultural orientation with the CVSCALE developed by Yoo et al. (2011); CQ with the CQS developed by Ang et al. (2007); and conflict-management styles of avoiding, forcing, and problem solving with the Dutch scale for conflict handling developed by De Dreu et al. (2001). Caputo et al. explained that the cultural orientation of collectivism puts the needs of the group before the needs of the individual; long-term orientation is the societal focus on the future and how far into the future the society focuses; masculinity is the level to which a society adheres to, assigns, or creates stereotypical gender roles; power distance is how tolerant a society is regarding inequity; uncertainty avoidance is social tolerance for ambiguity. The researchers explained that the conflict-management styles of avoiding characterizes how much an individual avoids conflict, forcing characterizes how willing an individual is to exert force to resolve conflict, and problem-solving characterizes how willing an individual is to compromise to resolve conflict.

Caputo et al. (2018) tested for direct relations between cultural orientations and conflict-management style before exploring whether CQ dimensions moderated those relations. They found that power distance was positively related to the avoiding and forcing styles of conflict management; uncertainty avoidance was positively related to the avoiding style of conflict management and negatively related to the forcing style of conflict management; collectivism was positively related to the problem-solving style of conflict management; masculinity was negatively related to the problem-solving style of

conflict management and positively related to the forcing style of conflict management; long-term orientation was positively related to the forcing and problem-solving styles of conflict management.

Caputo et al. (2018), turning to moderation, found that motivational CQ positively moderated the relation between long-term orientation and the avoiding communication style. The authors found that cognitive, metacognitive, and motivational CQ positively moderated the relation between the forcing communication style and power distance as well as uncertainty avoidance. The researchers found that cognitive CQ had a negative moderating effect on the relation between the forcing style and masculinity and behavioral CQ had a positive moderating effect on the relation between the forcing style and power distance. In further testing, Caputo et al. found that metacognitive CQ positively moderated the relation between the problem-solving communication style and power distance as well as long-term orientation; motivational CQ positively moderated the relation between the problem-solving communication style and masculinity as well as long-term orientation; behavioral CQ positively moderated the relation between the problem-solving communication style and long-term orientation. Although cognitive CQ had a direct effect on problem solving, there was no moderating effect. Caputo et al. argued that their results provide insights into how cultural orientations impact communication styles and CQ's effect on those relations. The authors' findings also add support for the inclusion of motivational CQ, which moderated multiple relations between types of communication styles and cultural orientations. Awan et al. (2018b),

like Caputo et al., investigated all four dimensions of CQ as moderators of the relations between phenomena.

Awan et al. (2018b) researched whether individual dimensions of CQ moderated the relations among contract governance, collaboration with suppliers, and social performance for employees of export-focused manufacturing firms in Pakistan. The authors explained that contract governance occurs when parties enter into a contracted agreement that defines how the relation will be governed. The researchers further explained that such contracts create a mutual understanding of expectations, rights, obligations, and the dynamics of exchanges, as well as protecting and influencing future agreements. Awan et al. developed a four-item measurement for contract governance through the lens of the supplier, focusing on information sharing, coordination, having detailed contract terms, and decision-making. The authors measured CQ using the CQS developed by Ang et al. (2007), collaboration with the supplier with a scale that drew from Awaysheh and Klassen (2010), and social performance improvement in terms of the improvement of individuals, safety, health, and environmental issues. Awan et al. explained that Pakistani managers' cultural orientations reflected high collectivist, long-term, and uncertainty avoidance orientations. The authors did not discuss the level of masculinity or power distance in Pakistani managers' cultural orientations.

Awan et al. (2018b) found a positive relation between collaboration and social performance and a positive relation between contract governance and collaboration propensity. The authors argued that these findings reflect the benefits of contract governance to firms' operations and activities as well as the ability of firms in Pakistan

who engaged in contract governance to improve their position in the market and ability to procure resources. The researchers found that cognitive CQ did not affect the relation between contract governance and collaboration and argued that this is most likely due to the fact that cultural knowledge is not influential enough to overcome negative stereotyping and the emotional reactions such thinking creates about people from other cultures, which impedes the ability to modify behavior. The authors argued further that manager from firms in collectivist cultures are resistant to learning and applying knowledge about "similarities and differences in cultural values and norms." The researchers found that metacognitive CQ had a positive moderating effect on the relation between contract governance and collaboration, arguing that managers from firms with long-term cultural orientations value traditions and are aware of the role cultural differences play in creating dynamics that result in long-term relationships.

Awan et al. (2018b) argued further those managers attend to buyers' responses to form and understand their own reactions, thereby limiting the impact of cultural bias and fostering cross-cultural understanding. The authors explained that this argument is supported by metacognitive CQ's moderation of the relation between contract governance and collaboration: when metacognitive CQ is high the positive relation between contract governance and collaboration is strengthened. Awan et al. found that motivational CQ moderated the relation between contract governance and collaboration and argued that this reflected Pakistani managers' high level of uncertainty avoidance, which resulted in them focusing their energy and effort toward adaptation, which is reflected in motivational CQ's ability to strengthen the relation between contract

governance and collaboration. The authors found that behavioral CQ does not moderate the relation between contract governance and collaboration and argued that this reflects Pakistani managers' neglect of nonverbal skills and cues when communicating. This may seem to contradict the argument that Pakistani managers seek to assimilate, but the authors explained that motivation to assimilate is limited to local norms and does not encompass international norms.

Awan et al. (2018b) further argued that Pakistan is an emerging economy with regard to multinational corporate development and, as such, the implementation of rules and regulation is inconsistent due to political uncertainty. The authors stated that the metacognitive and motivational CQ social-relations mechanisms enhance the stabilizing effect of contract governance on collaboration. Awan et al.'s work demonstrated the importance and stabilizing effect that CQ can have when there is high political uncertainty. Awan et al's work demonstrated that metacognitive and motivational CQ can act as moderators between knowledge/cognition (contract governance) and behavioral outcomes (collaboration) supporting my research. Awan et al. (2018a) also studied the relation between relational governance, commitment sustainability, and the four dimensions of CQ for managers working in Pakistan.

Awan et al. (2018a) explained that relational governance occurs when parties focus on successfully fulfilling and accomplishing joint aims and use this motivation to govern and set the relational norms and standards within transactions. The authors argued that commitment to sustainability is the level of consistency a buyer exhibits regarding buying from a particular firm. To measure CQ, Awan et al. used the CQS developed by

Ang et al. (2007) as used in Ang, Rockstuhl, and Tan (2015). Awan et al. measured relational governance via an adapted measure from Lusch and Brown (1996) and commitment sustainability via four items from Aragón-Correa (1998). Awan et al. found a direct relation between relational governance and commitment to sustainability. The authors found that metacognitive and behavioral CQ positively moderate the relation between relational governance and commitment to sustainability; in contrast, motivational CQ was found to negatively moderate the relation. The authors argued that the negative moderating effect of motivational CQ reflects those individuals with high motivational CQ may choose to direct their energy into new relations and this, in turn, reduces commitment sustainability. The researchers postulated that some aspects of the negotiated dynamics in relational governance may be stress-inducing and require too much emotional labor to maintain, which would decrease commitment for those with high motivational CQ. The authors explained that their findings provide insights into how CQ can be used to adjust cross-cultural relational governance dynamics such that they improve commitment and create stability. Awan et al. investigated the relation between CQ dimensions and commitment sustainability, which is a cross-cultural outcome. Haniefa and Riani (2019) investigated whether the four dimensions of CQ could mitigate, via moderation, the negative relation between ethnic harassment and intention to leave and thereby improve stability.

Haniefa and Riani (2019) investigated whether the four dimensions of CQ and latent CQ moderated the relation between ethnic harassment and intention to leave for employees working throughout Indonesia. The authors explained that ethnic harassment

is most often experienced by minorities groups in the form of ethnic slurs, derogatory comments, or jokes about or to individuals, and exclusion from work-related or social interactions on the basis of ethnicity. Haniefa and Riani measured experience of ethnic harassment and intention to leave with scales developed by Schneider et al. (2000) and CQ with the CQS developed by Ang et al. (2007). Haniefa and Riani found that latent, metacognitive, and motivational CQ negatively moderated the known positive predictive relation between ethnic harassment and intention to leave. The authors argued that the moderating effect of latent CQ reflects the construct's ability to help individuals manage and cope with ethnic harassment in the workplace, which reduces their intention to leave. The authors explained that metacognitive CQ deepens an individual's understanding of the root of ethnic harassment and leads to the development of the ability to better process and cope with such harassment, whereas motivational CQ provides intrinsic motivation to endure and complete work assignments. The authors did not explain why moderating effects were not seen for cognitive and behavioral CQ.

Haniefa and Riani (2019) demonstrated that CQ can reduce the negative effects of ethnic harassment, supporting Ang et al.'s (2007) argument that CQ promotes positive social change. Bogilović et al. (2017) demonstrated that CQ disrupts one technique of ethnic harassment (knowledge hiding) and prevents this behavior from impacting team creativity, simultaneously demonstrating that CQ promotes positive social change and that it reduces corporate losses caused by a failure to share knowledge (Vlajčić et al., 2019). The findings of Chua and Ng (2017) and Şahin and Gürbüz (2017) directly supported my research by demonstrating that metacognitive CQ positively moderates the

relation between cognitive CQ and phenomena. Specifically, Chua and Ng found that cognitive CQ has an inverted U-shape relation with creativity that is moderated by metacognitive CQ such that the relation between cultural CQ and creativity only occurs when metacognitive CQ is low. Şahin and Gürbüz found that cognitive, metacognitive, motivational, and latent CQ positively moderated the relation between entrepreneurial orientation and international performance, demonstrating that Rockstuhl and Van Dyne's (2018) bi-factor model of CQ is sound; this is the model I propose to use in my research.

Research discussed in this section demonstrated that individual dimensions of CQ and latent CQ strengthen the relation between phenomena, which aids in fostering international alliances, communication, and stability in the face of political uncertainty; all of these are positive social outcomes (Awan et al., 2018a, 2018b; Caputo et al., 2018;). The exploration of individual dimensions and latent CQ supported Ang et al.'s (2007) inclusion of motivational CQ as a domain because multiple authors found mediating and moderating relations for motivational CQ and latent CQ. This additionally provides support for Rockstuhl and Van Dyne's (2018) bi-factor model, which includes four autonomous dimensions of CQ and a latent dimension (Korzilius et al., 2017; Şahin and Gürbüz, 2017;).

The investigation into CQ as a mediator also provided deeper insights to the relation between culture and language as well as the role that CQ plays in the development of empathy and social closeness (Kanchanaprapas, 2019; Pawlicka et al., 2019). CQ, via mediation, enhances positive professional cross-cultural outcomes at the group level and improves international relationship development between business

partners (Dogra & Dixit, 2019; Pandey & Lucktong, 2020). Investigating the mediating and moderating effects of dimensions and latent CQ provides insights into the construct's ability to improve cross-cultural outcomes, including the reduction of ethnic harassment, the enhancement of empathy, and the improvement of business outcomes (Bogilović et al., 2017; Pandey & Lucktong, 2020). Research discussed in this section demonstrated CQ dimensions' ability to act as mediators and moderators and informed my reasoning for testing for mediation and moderation among dimensions (Chua & Ng, 2017; Korzilius et al., 2017; Şahin & Gürbüz, 2017). Henderson et al. (2018) results further inform my research. They investigated CQ's role in higher-order relations, such as moderated mediation, and argued that such research provides insights into the conditions and processes that activate CQ dimensions. This argument strengthens my own argument that exploring higher-order relations among dimesons will clarify the boundary conditions that create CQ effects.

Higher-Order relations and Interrelations of CQ Dimensions

CQ dimensions have higher-order relations and interrelations relations with each other and phenomena (Racicot & Ferry, 2016). Hayes (2018) explained that higher-order relations occur when dimensions have multiple relations such as serial mediation in which there are multiple mediators. Other higher-order relations discussed by Hayes included but were not limited to parallel mediation, and moderated moderation. In this section on higher-order relations and interrelations of CQ dimensions, I will discuss the interaction between CQ dimensions with a discussion of my research interwoven throughout. An example of this is Racicot and Ferry's (2016) work that found the higher-

order relation of serial mediation and suggest that motivational CQ may predict metacognitive CQ.

Higher-Order Relations and Interrelations Between Dimensions

Racicot and Ferry (2016) employed a time lagged quantitative approach to examine the relation between two dimensions of CQ (metacognitive and motivational), cross-cultural experiences, study abroad, and intention to study/work abroad for undergraduate students attending a large public university in the mid-Atlantic region of the United States who participated in a five-week study abroad program in one of the following countries: Australia, New Zealand, London, and Singapore. The authors used the items designed to measure metacognitive and motivational CQ from the CQS developed by Ang, et al. (2007) which was administered two months before the students left for their study abroad program and again four weeks after the students returned. A four-question survey developed by Racicot and Ferry was used to measure cross-cultural experience and intention to work abroad. Racicot and Ferry reported that 106 students completed the time one survey and 60 completed the time two survey delivered via email with a link to the survey on Qualtrics, a survey design, distribution, and analysis service. Racicot and Ferry used the Hayes' (2013) conditional process analysis (PROCESS) to test for direct, indirect, and serial mediation relations.

Racicot and Ferry (2016) found a positive and predictive relation between motivational CQ and metacognitive CQ; metacognitive CQ had a positive and predictive relation with experience gained while abroad; experience gained had a positive predictive relation with future interest in engaging in study/work abroad opportunities. The authors

found a multiple mediating relation with metacognitive CQ and experiences gained modifying the relation between study abroad and future interest to study/work abroad. Racicot and Ferry argued that there may be a serial meditated relation in which motivational CQ predicts metacognitive CQ which predicts that cross-cultural experiences had during study abroad programs predict the desire to engage in future study/work abroad opportunities. The authors did not test for this relation and argued that this should be studied in the future. Racicot and Ferry's findings that motivational CQ predicts metacognitive CQ and the suggestion that the dimensions should be investigated for a serial mediation relation in conjunction with the demonstration that metacognitive CQ can act as mediator in a multiple mediated relation supported my investigation of a serial, and parallel mediation relation in the path from cognitive CQ to behavioral CQ through motivational CQ and then metacognitive CQ. Gooden et al. (2017) also supported my research via the establishment of direct relations between dimensions.

Gooden et al. (2017), investigated if cognitive, metacognitive, motivational CQ had a positive predictive relation with behavioral CQ for MBA students attending a university in the United States. To measure CQ, the authors used the CQS developed by Ang, et al. (2007) and validated by Ang and Van Dyne (2006). The authors found that, when combined, cognitive, metacognitive, and motivational CQ had a positive and predictive relation with behavioral CQ. The authors also found positive predictive relations between motivational and metacognitive CQ, motivational and cognitive CQ, metacognitive and cognitive CQ, metacognitive and behavioral, as well motivational, and behavioral CQ. The researchers argued that future research should be done to further

validate their findings. My research tested simple indirect relations as part of testing for higher-order relations among the dimensions as suggested in Hayes (2018).

Gooden et al. (2017) did not test for indirect relations or effects such as mediation and moderation. Nor did they test for higher-order relations such as serial mediation, parallel mediation, or moderated moderation as proposed in my research. The authors focused instead on proving whether direct relations existed between the dimensions as suggested by Ang et al. (2007). Gooden et al. supports the argument for my research by demonstrating that there are direct relations between CQ dimensions and calling for future research into the relations among dimensions. Chua and Ng (2017) support Gooden et al. founding a direct relation between cognitive CQ and metacognitive CQ.

Chua and Ng (2017) investigated the relation between two dimensions of CQ (cognitive and metacognitive) and creativity in a global context for students in their final year at a Singapore school of business enrolled in a fourteen-week international organizational behavior course. The authors explained that a global context is multicultural and multinational and creativity in such a context requires the ability to connect ideas from multiple cultures in such a way as to create solutions that would not be obvious from a single culture's perspective. The authors measured cognitive and metacognitive CQ with items designed to measure these variables taken form the CQS developed by Ang, et al. (2007) and developed a five-item survey to measure creativity.

Chua and Ng (2017) found a positive relation between cognitive CQ and creativity, metacognitive CQ and creativity, as well as between metacognitive and cognitive CQ. The authors found that metacognitive CQ mediated the relation between

cognitive CQ and creative such that the relation was strengthened when metacognitive CQ was low, and there was no relation between cognitive CQ and creativity when metacognitive CQ was high. Chua and Ng explained that they had not expected increased metacognitive CQ to negatively impact cognitive CQ relation with creativity and stated that these findings reflect that too much cultural knowledge impedes creativity. The authors are unsure if this is due to depth or breadth of cultural knowledge and suggest that more research into the nature of cultural intelligence needs to be done. Chua and Ng's work supports my research calling for more research into the relation between cognitive and metacognitive CQ and how this relation impacts behavioral outcomes such as creativity.

Additionally, Chua and Ng (2017) found that metacognitive CQ moderated cognitive CQ's effect on phenomena, which supports my argument that metacognitive CQ may moderate the relation between cognitive CQ and behavioral CQ. Chua and Ng's findings that high metacognitive CQ negated cognitive CQ's direct relation with the behavioral outcome of creativity provides insights into how metacognitive CQ may impact the relation between cognitive CQ and behavioral CQ and why Gooden et al. (2017) found no direct relations between cognitive CQ and behavioral CQ when tested without metacognitive and motivational CQ. Regarding moderation, because Gooden et al. combined cognitive, metacognitive, and motivational CQ in their test of multiple dimensions' relations with behavioral CQ, it is unclear if metacognitive or motivational CQ is moderating the relation. I tested if metacognitive and motivational CQ individually moderate the relation between cognitive and behavioral CQ in addition to testing if

metacognitive and motivational CQ have a moderated moderation effect on the relation between cognitive and behavioral CQ. Rockstuhl and Van Dyne (2018) provide further support for my research by investigating the ability of metacognitive CQ to moderate cognitive, motivational, and behavioral CQ's relations with outcomes.

Rockstuhl and Van Dyne (2018) argued that metacognitive CQ would moderate the effect of cognitive, motivational, and behavioral CQ on cross-cultural outcomes. The authors found that metacognitive CQ moderated the positive predictive relation between cognitive CQ and sociocultural adjustment such that when metacognitive CQ was high, the positive effect was strengthened. The researchers found that metacognitive CQ moderated the negative relation between cognitive CQ and task performance in such a way as to reduce the negative effect when metacognitive CQ is high. The authors found that metacognitive CQ positively moderated the positive predictive relation between motivational CQ and task performance, making it stronger. The researchers similarly found that metacognitive CQ moderated the positive and predictive relation between behavioral CQ and sociocultural adjustment as well as task performance, strengthening behavioral CQ's effects.

Finally, Rockstuhl and Van Dyne (2018) found that metacognitive CQ moderates the relation between latent CQ and sociocultural adjustment, weakening the positive predictive effects of latent CQ. The authors argued that moderated relations reflect the importance of all four dimensions in the development of positive intercultural outcomes and support Earley & Peterson's (2004) argument that CQ training should focus on simultaneously raising all four dimensions.

Rockstuhl and Van Dyne (2018) argued that their findings reflected that each of the dimensions play an intricate role in the development of CQ outcomes and that metacognitive CQ can strengthen positive outcomes and mitigate negative outcomes. Rockstuhl and Van Dyne's work supports my research because they demonstrated that metacognitive CQ has a moderating effect on the three other dimensions of CQ and their relations with phenomena. Sharma (2019) turns our attention back to CQ and mediation and the relation between cognitive and metacognitive CQ.

Sharma's (2019) findings regarding the mediation of CQ effects on institutional success via relationship quality is thoroughly discussed in the mediation of CQ effects section of this review. In addition to finding that CQ effects were mediated, the authors found that cognitive and metacognitive CQ are interrelated and that their interrelation has a positive direct relation with relationship quality. The researcher also found that the interaction between cognitive and metacognitive CQ has a positive and direct effect on institutional success. Additionally, Sharma found that metacognitive CQ has a direct effect on relationship quality and intuitional success whereas cognitive CQ on its own does not when there is a positive relation between cognitive CQ and relationship quality when metacognitive CQ is high. The researcher also found that the effects of metacognitive CQ and cognitive CQ were stronger when combined. And finally, the author found that relationship quality positively mediated the relation between cognitive and metacognitive CQ and institutional success.

Sharma's (2019) work supported my research by finding that metacognitive CQ effects cognitive CQ relations with phenomena and that, when separated, cognitive CQ

on its own may have no direct effect. Soga (2019) similarly found that cognitive and metacognitive CQ interact. Soga found relations between CQ, narcissism, and export performance. The authors measured CQ using the CQS developed by Ang, et al. (2007). Soga found that metacognitive CQ positively impacts cognitive CQ, and that cognitive CQ and motivational CQ interact. Soga argued that this demonstrated that motivational CQ should be included as a dimension of CQ.

Soga's (2019) as well as Henderson, Stackman, and Lindekilde's (2018) findings support the inclusion of motivational CQ as a dimension and dispute Thomas et al. (2008) as well as Liao and Thomas' (2020a) argument for exclusion by demonstrating that motivational CQ individually and autonomously interacts with phenomena, creating unique effects. Henderson et al. found that motivational CQ had both moderating and mediating effects. In addition to supporting the inclusion of motivational CQ as a dimension, Henderson et al. also partially supported my research by demonstrating that motivational CQ does have higher-order relation effects such as moderated mediation. Although I do not test moderated mediation, my research did investigate higher-order relations between dimensions. As discussed, I tested for serial mediation and moderated moderation between those dimensions.

Racicot and Ferry (2016) found a multiple mediating relation in which metacognitive CQ and experienced gained mediated the relation between study abroad experiences and future interest to study/work abroad. Racicot and Ferry argued that there may be a serial meditation relation between motivational and metacognitive CQ because of the predictive nature of the relation. The authors argued that their research

demonstrated the need for more research into the protentional serial mediation effects in the relation between motivational and metacognitive CQ, which I investigated.

I also tested for parallel mediation because, as demonstrated by Racicot and Ferry, metacognitive CQ's interaction has resulted in a mediation effect. Specifically, I investigated if metacognitive and motivational CQ have a serial mediation and/or parallel mediation effect on the relation in the path between cognitive and behavioral CQ. Furthermore, I built on the works Earley and Ang that theorized that the four dimensions of CQ may have interrelations, and Gooden et al. (2017) who found direct relations between the dimensions but did not investigate indirect relations. I investigated indirect and higher-order relations among the dimensions such as mediation, moderation, moderated moderation and, as previously mentioned, serial mediation and parallel mediation. I provided a deeper understanding of the CQ nomological network via the study of the interrelations between the dimensions as called for by Rockstuhl and Van Dyne (2018).

Summary

Earley (2002) investigated the relations between culture and business and how the blending of the two led to cultural divides that cost human lives, as well as an estimated two billion dollars annually for American companies due to failed overseas work assignments, and $31.6 billion annually for multinational corporations due to intercultural communication breakdowns (Kwantes & Glazer, 2017; Vlajčić et al., 2019). This led to the development of CQ theory and the quantitative validation of a four dimensions model of CQ (cognitive, metacognitive, motivational, and behavioral) as well as the Cultural

Intelligence Scale (Ang et al., 2007). In August of 2016, I began my research in CQ because I wanted to understand why some people are able to thrive in multicultural setting and others are not. A literature review conducted by Ott and Michailova (2018) identified the gap in the literature as works that focused on the mediating and moderating properties of CQ. Investigating the literature on mediation, moderation, and CQ led me to the works of Racicot and Ferry (2016), Gooden et al. (2017), and Rockstuhl and Van Dyne (2018).

Racicot and Ferry (2016) quantitatively found that motivational CQ predicts metacognitive CQ and called for future researchers to investigate serial mediating effects of these two dimensions. Gooden et al. (2017) quantitatively found direct relations between the four dimensions of CQ (cognitive, metacognitive, motivational, and behavioral) and called for more investigation into interactions among dimensions. Rockstuhl and Van Dyne's (2018) metanalysis found that metacognitive CQ moderated the relations between cognitive, motivational, and behavioral CQ dimensions and phenomena. They called for more investigation into the relations between CQ dimensions. This identified mediation, moderation, serial mediation, parallel mediation, and moderated moderation relations among CQ dimension as a gap in the literature. This gap in the literature informed the formation of my research questions. I was sure to leave alerts active for key terms to remain aware of new developments in the field of CQ research. To date the gap of interrelations of the CQ dimensions remains.

I focused on mediation, moderation, serial mediation, parallel mediation, and moderated moderation, tested using the Hayes PROCESS (Hayes, 2018). Hayes (2019)

refereed to relations that involve more than one meditator, more than moderator or both mediation and moderation as higher-order relations. Hayes (2018) argued that when testing for mediation and moderation other relations should be tested for as well. Henderson et al. (2018) supported Hayes' argument that testing for mediation, moderation, and higher-order relations will limit the likelihood that significant relations are missed, as demonstrated by the findings that motivational CQ effects include both simple and higher-order relations. Racicot and Ferry (2016) argued for testing of higher-order relations among the dimensions specifically for serial meditated relation between metacognitive and motivational CQ.

Additionally, Soga (2019) as well as Henderson et al. (2018) found that motivational CQ had higher-order relations with phenomena. As discussed, I contributed to the discussion of motivational CQ's inclusion in the CQ construct. In my research I investigated whether motivational CQ and metacognitive CQ have a mediation, moderation, moderated moderation, serial mediation, and parallel mediation effect on the relation between cognitive and behavioral CQ. I also tested if motivational CQ moderates the relation between metacognitive CQ to behavioral CQ. With my research I added to the nomological network of CQ, as suggested by Rockstuhl and Van Dyne (2018), via the study of the interrelations between the dimensions (Hayes, 2018).

Conclusion

As with Rockstuhl and Van Dyne (2018), Earley (2002), and Earley and Ang (2003), my work was born of a desire to provide an understanding of how to improve an individual's ability to thrive in multicultural settings and reduce losses (Ang et al., 2007).

In researching the mediation and moderation of CQ's relations with phenomena, vital information regarding "how" and "when" such relations create variations in educational, professional, interpersonal, and training outcomes was gained because the underlying processes that affect the creation of CQ were revealed (Alexandra, 2018a; Alexandra et al., 2021; Lorenz et al., 2018;).

Hayes (2018) argued that if there is reason to suspect that the independent variable's effect on the dependent variable is the result of more than one effect, the strongest statistical tests are those that include higher-order relations. Henderson et al.'s (2018) findings provide support for my argument that motivational CQ may have multiple effects. The authors found that motivational CQ acted as a mediator, moderator, and was involved in moderated mediation. These findings support my argument for testing motivational CQ as a meditator and as a moderator in the relation between cognitive CQ and behavioral CQ. In further support of my research, Racicot and Ferry (2016) found that motivational CQ predicted metacognitive CQ. The authors argued for research into whether the predictive relation creates serial mediation effects. As stated through this work, my research included testing for both serial and parallel mediation in the path from cognitive to behavioral CQ via motivational and metacognitive CQ.

None of the authors discussed who found interaction between the dimensions explored the relations my research tested. My research questions focused on whether the interaction between metacognitive, motivational, and cognitive CQ included mediation, moderation, serial mediation, parallel mediation, or moderated moderation. Racicot and Ferry (2016) used the Hayes' (2013) conditional process analysis (PROCESS) to test for

direct, indirect, and serial mediation relations. I too used the Hayes PROCESS in my quantitative research because it allowed me to test for simple and higher-order relations among the CQ dimensions (Hayes, 2018).

Chapter 3: Research Method

The purpose of my research was to test for mediation, moderation, serial mediation, parallel mediation, and moderated moderation by motivational and metacognitive CQ in the path from cognitive to behavioral CQ as well as moderation by motivational CQ in the path from metacognitive to behavioral CQ. Exploration of the interactions and relations among CQ dimensions can improve positive outcomes in intercultural settings by facilitating new training approaches (Rockstuhl & Van Dyne, 2018). With Research Questions 1–3, I focused on serial and parallel mediation in the path from cognitive CQ to behavioral CQ through motivational CQ and metacognitive CQ; Questions 4 and 5 concerned simple mediation of the relation between cognitive and behavioral CQ by metacognitive and motivational CQ, respectively. With Research Question 6 I focused on the moderated moderation relation in the path from cognitive CQ to behavioral CQ moderated by metacognitive CQ, with the path from cognitive CQ to metacognitive CQ moderated by motivational CQ. Questions 7 and 8 were focused on the moderation of the relation between cognitive CQ and behavioral CQ by metacognitive CQ and motivational CQ respectively, and Research Question 9 concerned the moderation of the relation between metacognitive CQ and behavioral CQ by motivational CQ.

In the research rationale and research variable sections, I detail the specific relations I studied between the four dimensions of CQ using a correlation design as well as various mediating and moderating conditional models (Hayes, 2018). The specific relations and models I tested are depicted in Figures A1–A9. Because I am using a

correlational design and various mediating and moderating models in addition to the subject matter not being time-sensitive, there are no time constraints to be considered. All nine research questions are supported by the literature (Racicot & Ferry, 2016; Henderson et al., 2018; Chua & Ng, 2017; Sharma, 2019; Soga, 2019). As detailed in the methodology section, my sample size was determined in conjunction with my committee member Dr. Diebold.

In the methodology section, I discuss how the data were analyzed and how the relations among dimensions were measured using the Hayes (2018) PROCESS add-on for IBM SPSS. I used Van Dyne's (2015) operationalization of the CQ dimensions. Because Van Dyne et al. (2015) validated the CQS using a population living in the United States, I used a population living in the United States, regardless of citizen status, for my research. As discussed more fully in the population, sampling and participant eligibility sections, my population additionally consisted of adults 18 years or older, who identified as English speakers and have a high school diploma from an accredited four-year high school program, selected from the audience members who participate in the SurveyMonkey system.

My sample size of 224 was determined via correspondence with my methodologist, Dr. Diebold, using a Monte Carlo Simulation system. As detailed in the participant recruitment section, 264 participants were recruited from the SurveyMonkey eligible audience pool via email invitation. The letter of invitation and the informed consent appeared on the survey and the exact wording can be found in Appendix E.Once cleaning of the data was completed a sample 225 completed CQS was retained.

The validation of the CQS by Van Dyne et al. (2015) and my data analysis plan are discussed in detail in the operationalization of variables and definitions section as well as in the data analysis plan section. Permission to use the CQS is granted for the purpose of research by Van Dyne et al. (2015) and a verbatim copy of the permission can be found in Appendix C. Threats to validity are addressed as are statistical and conclusion validity to improve confidence in my findings. The measures taken to ensure that the research follows ethical procedures are also outlined for review and to ensure that harm to participants is limited. Van Dyne et al. (2015) found that taking the CQS caused stress not more than that encountered in daily life. In addition to this low risk, I have provided informed consent details to inform potential participants of their rights. The exact language of the informed consent can be found in Appendix D. The research rationale and design will also provide insights into ethics by detailing the rationale behind this research.

Research Design and Rationale

Relations between the four dimensions of CQ—cognitive, motivational, metacognitive, and behavioral—were examined in a correlational research design using various mediating and moderating conditional models (Hayes, 2018) as depicted in Figures A1–A9. In all models, behavioral CQ was the dependent variable with the first eight models using cognitive CQ as the independent variable and the final model using metacognitive CQ as the independent variable. In Hayes's (2018) terminology, the independent variable in a mediation or moderation model is the antecedent and the dependent variable is the consequent. All nine models used motivational CQ,

metacognitive CQ, or both as mediator or moderator. Two of the models were simple mediation (Figures A4 & A5, RQs 4 & 5), and three were simple moderation (Figures A7–A9, RQs 7–9). Two models were serial mediation (Figures A1 & A2, RQ1 & RQ2), one is parallel mediation (Figure A3, RQ3), and one was moderated moderation (Figure A6, RQ6).

Prior research has examined antecedents of one or more of the CQ dimensions (e.g., Ang et al., 2006; Adair et al., 2016; Alexandra et al., 2021; Fakhreldin, 2020; Fang et al., 2018; Lin & Shen, 2019; Young et al., 2017a). Authors researched one or more of the CQ dimensions as antecedents to or correlates of various phenomena (e.g., Alexandra et al., 2021; Baratipour & Amini, 2020; Rockstuhl & Van Dyne, 2018; Young et al., 2017b; Vlajčić et al., 2019). Researchers investigated mediators of the relation between one or more CQ dimensions and certain phenomena (Gebregergis et al., 2019; Jyoti & Kour, 2017; Kewarin & Rujira, 2019; Lin & Shen, 2019), one or more of the CQ dimensions as mediator between phenomena (e.g., Dogra & Dixit, 2019; Pawlicka et al., 2019). Authors investigated one or more of the CQ dimensions as moderator between phenomena (e.g., Alexandra et al., 2021; Caputo et al., 2018; Awan et al., 2018a, 2018b; Henderson et al., 2018). Gooden et al. (2017) investigated the simple interrelations among the CQ dimensions. Several researchers have called for further study of the interrelations between CQ dimensions (Racicot & Ferry, 2016; Rockstuhl & Van Dyne, 2018; Sharma, 2019; Soga, 2019).

Researchers who study CQ have argued that further study of the interrelations between CQ dimensions advance knowledge in the field (Azevedo & Shane, 2019;

Henderson et al., 2018; Racicot & Ferry, 2016; Rockstuhl & Van Dyne, 2018). To study interrelations among the dimensions, research and analysis designs need to account for various mediation and moderation effects among the CQ dimensions (Hayes, 2018). Mediation answers "how" an effect occurs and moderation answers "when" and "under what conditions" an effect occurs (Hayes & Rockwood, 2017). I examined multiple models, some mediation and some moderation, to address the concern that if a scientist only tests for one or the other they are almost certain to miss potentially important relations.

A correlational design of various mediating and moderation models does not have inherent time or resource constraints (Hayes, 2018). The subject matter was not time-sensitive, so there was no constraint on data collection needing to be completed within a specific timeframe. Data were collected using an online survey, so data collection was constrained to participants with internet access. Participants were from SurveyMonkey Audience for which I paid a fee that was not an undue resource constraint. In the next section I detail my research questions and variables in the next section.

Research Variables

With Research Questions 1–3, I focused on serial mediation and parallel mediation in the path from cognitive CQ to behavioral CQ through motivational CQ and metacognitive CQ. For the development of these questions, I drew on the work of Racicot and Ferry (2016), who argued for further exploration of the relations between CQ dimensions. Specifically, the question to be answered was whether there is a serial or parallel mediating relation of motivational and metacognitive CQ on the relation between

cognitive CQ and behavioral CQ, which is theoretically well-founded because Racicot and Ferry found that metacognitive CQ and work experience have a multiple mediating relation with motivational CQ and future interest in work/study abroad. The authors explained that motivational and metacognitive CQ may therefore function in a sequential mediating manner, but the existence of such a relation had not yet been established.

Research questions one, two and three are also supported by Henderson et al.'s (2018) research that demonstrated the importance of testing for mediation, moderation, and higher-order relations. By doing so, they found that motivational CQ has moderating, mediating, and moderated mediation effects. Specifically, the authors found that motivational CQ positively mediated the relation between communication-norms alignment and global project team members' satisfaction with their team, moderated the positive relation between communication-norm alignment and role clarity, and positively moderated the mediating effect of role clarity on the positive relation between communication-norm alignment and job satisfaction as well as assignment-specific performance. Henderson et al.'s (2018) research demonstrated that motivational CQ can act as a mediator and moderator and higher-order relations. Henderson et al.'s (2018) findings in conjunction with Racicot and Ferry's (2016) word supported my development of research questions four, five, six, seven, eight and nine. With research questions four and five I examined simple mediation of the relation between cognitive and behavioral CQ by metacognitive and motivational CQ respectively. I also examined higher-order relations as with research question seven by focusing on moderated moderation in the

relation in the path from cognitive CQ to behavioral CQ moderated by metacognitive CQ with the path from cognitive CQ to metacognitive CQ moderated by motivational CQ.

Just as Henderson et al. (2018) supported the argument for researching simple mediation along with higher-order relations, Chua and Ng (2017) provided support for research into simple mediation and moderation, finding that metacognitive CQ acts as both a mediator and a moderator of cognitive CQ's effects on phenomena. In further support of my research, Sharma (2019) found that cognitive and metacognitive CQ are interrelated, and that this interrelation positively impacts behavioral outcomes such as relationship quality and institutional success. Along similar lines, Soga (2019) found that metacognitive CQ positively impacts cognitive CQ, and that cognitive CQ and motivational CQ interact. Although interactions between the dimensions of CQ have been demonstrated, prior to my research the pathway from cognitive CQ to behavioral CQ had not been investigated to determine what effects motivational and metacognitive CQ may have on the relation. With my quantitative research, I focused on the interrelations between CQ dimensions using the 20-item CQS validated by Van Dyne et al. (2015) which is discussed more fully in the next section.

Methodology

The CQS validated by Van Dyne et al. (2015) is an English language self-report questionnaire. My population, sampling procedures, and population frame reflect the population for which the CQS was designed (Ang et al., 2007). The sample size was determined in conjunction with my committee member Dr. C. T. Diebold (personal communication, December 10, 2020). .). The data was analyzed and the relations among

dimensions were measured using the Hayes (2018) PROCESS addon for IBM SPSS because this allowed me to test for mediation, moderation, serial mediation, parallel mediation, and moderated moderation of the four dimensions of CQ. Dimensions have been operationalized by Ang et al. (2007) and validated by Van Dyne et al. (2015). As well as operationalizing and validating the CQS, Van Dyne et al. (2015) discussed the populations used with CQS which was similar to the population used in my research.

Population

In my quantitative research, my population was 267 SurveyMonkey audience members who were adults over the age of 18 who have at least a high school degree, identify as English-speaking, have Internet access and, live in the United States at the time of participation including American and non-American citizens. I used the CQS, a 20-item self-report survey validated by Van Dyne et al. (2015) as the psychometric instrument. My population was limited to those over the age of 18 because the CQS has not been validated for use with minors. I also limited my participants to those who identify as English speakers because I used the English version of the CQS (Van Dyne et al., 2015). My final criterion was that participants be living in the United States at the time of taking the survey.

Sampling and Sampling Procedures

Convenience sampling was chosen because my research was limited to the SurveyMonkey audience. A convenience sample is often used when testing relations between phenomena, as in my study where I test for mediation, moderation, serial mediation, parallel mediation, and moderated moderation (Etikan et al., 2016). I used the

SurveyMonkey platform exclusively to deliver the survey. The following information comes from the SurveyMonkey's website page entitled "Buying Responses with SurveyMonkey Audience". Once I created a SurveyMonkey account and began my research, I set my demographic qualifying questions to adults who lived in the United States at the time of participation and identified as English speakers. SurveyMonkey sent the survey to their contribution panel, which consists of SurveyMonkey audience members who take surveys regularly and have been emailed an invitation to take my survey. The contributing panelists who agreed to participate in the survey donated their time and SurveyMonkey made a 0.50 USD donation to a charity of the panelists' choosing for each survey they take. The invitations were sent via email and once my survey was completed, they notified me via my SurveyMonkey account and Walden email account that my survey was complete.

Convenience sampling may not provide geographic diversity, which could limit the generalizability of the findings. However, online survey services such as SurveyMonkey have access to more people as well as greater geographic and demographic diversity than available with in-person sampling (Etikan et al., 2016; Rice et al., 2017). By using the SurveyMonkey platform, I was able to gather responses from nine regions of the United States, which provided greater geographic diversity than using a single-city in-person sample (Rice et al., 2017). Though only participants who are online at the time the survey is delivered will see the survey, services such as SurveyMonkey and Amazon's MTurk audience diversity and size enhances the generalizability of survey findings, which improves the confidence in the conclusions of

research that uses either service while reducing financial and time demands (Rice et al., 2017).The authors pointed out three main disadvantages to online convenience sampling via SurveyMonkey and Amazon MTurk: an inability to give equal access to all participants who fit the participant frame; only participants who are online at the time the survey is delivered will see the survey; and online sample participants are chosen on a first-response basis until the desired number of respondents have answered. Rice et al. also pointed out that most online survey site members belong to multiple services, so using more than one service does not guarantee improved diversity or accessibility.

To improve diversity and accessibility, I used SurveyMonkey exclusively to create the contribution panel from their audience and to create my participant pool. SurveyMonkey has audience members in all 50 states in the United States, providing more diversity than I could achieve in person as I live in Japan and do not have access to people living across the United States. Rice et al. (2017) argued that online surveys services such as SurveyMonkey and Amazon MTurk are best used for researchers who seek to measure attitudes, not behaviors. The CQS is designed to measure cultural attitudes and perceptions of behaviors (Van Dyne et al., 2015). Etikan et al. (2016) argued that purposive sampling and interviews are best for researchers who seek to test interventions. I did not test intervention outcomes but, rather, informed on the interrelations among the dimensions of CQ characterized by the CQS. Etikan et al. wrote that interviews and purposive sampling are vital tools when developing theories or testing psychometric instruments. However, CQ theory and the CQS have been widely tested and validated (Van Dyne et al., 2015). The SurveyMonkey audience members who took

my survey came from nine different regions in the United States, which improves generalizability (Rice et al., 2017).

Participant Eligibility

My sample consisted of individuals over the age of 18 who identified as English-speaking, lived in the United States at the time of participation (regardless of citizenship), and had at least a high school diploma from an accredited four-year high school program. Because I used the SurveyMonkey service, participants had to be part of the SurveyMonkey audience and taking surveys daily to be eligible to become part of the contribution panel and potential respondents for my research. Once the SurveyMonkey audience member had been selected to be part of the contribution panel based on meeting the demographic criteria listed above they become eligible to respond to CQS and participate in my research.

I limited participants to adults 18 years or older because the CQS was designed for use with adults (Van Dyne et al., 2015). Although the CQS has been translated into languages other than English, I limited participants to those who identify as English speakers because I used the English version of the CQS and am not able to read languages other than English. I limited the participants to those living in the United States to reduce the cost of the survey. I limited participants to those with a diploma from an accredited four-year high school to exclude those who were homeschooled because traditionally educated students have, on average, higher reading comprehension than their homeschooled counterparts (Guterman & Neuman, 2019). By limiting the participant pool to those who attended and graduated from an accredited high school, I reduced the

chance of artifactual results arising from poor reading comprehension. I limited my participant pool to SurveyMonkey audience members to reduce the cost of the research and to allow the potential participant pool to include SurveyMonkey audience members form all 50 states in the United States.

Analysis Used to Determine Sample Size

The sample size was determined via correspondence with my methodologist, Dr. Diebold, as follows. A Monte Carlo Simulation system (https://schoemanna.shinyapps.io/mc_power_med/) was used to check the sample size needed for each of the four mediation models with powers of .70, .80, and .95 at α for each of = .05. Correlations from the meta-analysis conducted by Rockstuhl and Van Dyne (2018) were used as input. The correlation results are shown in Table 1, were cognitive and motivational at 0.54, cognitive and metacognitive at 0.56, cognitive and behavioral at 0.57, motivational and metacognitive at 0.65, motivational and behavioral at 0.57, and metacognitive and behavioral at 0.61 The sample size results for mediation between cognitive and behavioral CQ are displayed in Table 2.

Table 1

Meta-Analysis Result of Correlations Among CQ Dimensions

CQ Domain	Motivational	Metacognitive	Behavioral
Cognitive	.54	.56	.57
Motivational		.63	.57
Metacognitive			.61

Table 2

Sample Size for Paths Mediating Relation Between Cognitive CQ and Behavioral CQ

Path	Research Question, Model	Mediator	Sample Size[a]
a_1b_1	RQ2, Figure A2	Motivational→Metacognitive	117
	RQ4, Figure A4	Motivational	
a_2b_2	RQ2, Figure A2	Motivational→Metacognitive	200
	RQ3, Figure A3	Metacognitive	
a_1db_2	RQ1, Figure A1	Motivational→Metacognitive	179
	RQ2, Figure A2	Motivational→Metacognitive	

[a] Power = .95 at α = .05

This technique yielded a suggested sample size of 200 for the most exacting path. Sample size for the moderation models was conducted in two steps. First, using matrix algebra with the CQ meta-analysis correlations reported by Rockstuhl and Van Dyne, behavioral CQ was regressed on cognitive, motivational, and metacognitive CQ to determine the smallest predictor effect size as indexed by the squared semipartial correlation (sr^2), which was .0195, and the model's overall R^2, which was .449. The result of this suggested a sample size of 224 was necessary to achieve a power of .80 at α = .05 for the smallest predictor effect size. Next, using a commonly reported formula of the *F*-test for an incremental increase in a sequential regression (see e.g., Cohen et al., 2003, Jaccard & Turrisi, 2003; Tabachnick & Fidell, 2007), it was determined that a sample size of 224 with power = .80 and α = .05 would statistically significantly detect a small interaction effect of sr^2 = .019. Interaction effects in social science research tend to be small (Frazier et al., 2004). Therefore, a target sample size of 224 for my research was adequate to detect the effects of interest in the various mediating and moderating models.

Procedures for Recruitment, Participation, and Data Collection

Participants were recruited using the online survey-delivery platform SurveyMonkey. Once the survey was uploaded and my demographic requirements were

imput into the SurveyMonkey system, SurveyMonkey recruited audience members who take surveys on their platform daily and met my demographic requirements. SurveyMonkey's contribution and awards panel are their audience members who live in the United States, receive a .50 USD donation to a charity of their choosing, are entered into a drawing for a sweepstakes (the stie did not detail what the sweepstakes winner would receive), and earn credits that they can redeem for gift cards. SurveyMonkey balances their contribution and awards panel to be representative of U.S. census results and does no specific how this is done. I bought my responses from SurveyMonkey and did not pay participants.

I began by creating SurveyMonkey account, then I uploaded the CQS, clicked "buy responses," and entered demographic information. Individuals who attempt to take my survey but did not meet my demographic were not able to proceed beyond the demographic questions and were excluded from my survey results. Once I completed the steps to upload and purchase responses, SurveyMonkey sent an email invitation to participate in my research to all contribution and awards panel members who qualified. If the contribution and awards panel member agreed to take the survey, they were sent a link to the CQS via email.

The SurveyMonkey platform automatically collected demographic information beyond my specifications. The information automatically collected was "survey-taker's age-range, gender, type of device used to take the survey, income range, and region of the United States they live in". The demographic questions asked by SurveyMonkey were not relevant to my research and per Walden IRB recommendation were deleted as part of

the data cleaning process. SurveyMonkey's question bank did not include questions regarding type of education (accredited vs. homeschooled), if they identify as an English speaker, and if they live in the United States at the time of participation. I followed the instruction provided by the platform to add these qualifying questions.

Informed Consent and Data Collection

A two-page informed consent provided sufficient information for respondents to give informed consent appeared before the survey (Appendix D), and participants electronically indicated consent or left the survey without penalty. SurveyMonkey collected all survey responses. I selected the data-collection option offered by SurveyMonkey entitled a single survey plan. The features included in this package allowed gathering comments in one place to allow analysis, filtering of results, export of results in any of several formats, and integration with the IBM SPSS software.

The CQS was the survey I used and has been verified to not cause more distress than everyday life (Van Dyne et al., 2015); however, a free counseling hotline number was provided as part of informed consent. There was no follow up, and SurveyMonkey estimated that my survey would take approximately 6 minutes to take. SurveyMonkey offers standardized incentives for survey participation, and no additional incentive were offered. The results of my mediation, moderation, serial mediation, parallel mediation, and moderated moderation between CQ dimension testing will be published on SurveyMonkey website upon conclusion of the PhD process. Cost-free access to the completed and full dissertation will be provided via the Walden Dissertation and

Doctorial Studies page. I included information regarding how to access results as part of informed consent.

Instrumentation and Operationalization of Constructs

I used the CQS (Van Dyne et al., 2015) because it is widely used throughout the CQ literature (Ott & Michailova, 2018). The CQS was first presented at the 2004 Academy of Management Meetings Symposium on Cultural Intelligence in the 21st Century, which was held in New Orleans, Louisiana (Ang et al., 2004, August). In 2007, Ang et al. wrote a paper detailing the development and validation of the CQS. In 2015 Van Dyne et al. reduced Ang et al.'s (2007) CQS from 40 items to 20. Van Dyne et al.'s (2015) 20-item CQS was used in my research. The copyright of this instrument belongs to the Cultural Intelligence Center (2005). Permission for use of the scale in academic research is granted in appendix A of *Handbook of cultural intelligence: Theory, measurement, and applications*, which also lists the 20 items of the CQS Van Dyne et al., 2015). The exact wording of the permission to use the CQS for my study is shown in appendix C. In the development of the 40-item CQS, Ang et al. (2007) began with O'Neil and Abedi's (1996) operationalization of metacognition as the ability to know one is thinking and being able to plan and self-regulate while controlling and monitoring learning; they defined cognition as the ability to acquire new knowledge and the process of thinking. These operationalizations formed the basis for metacognitive and cognitive CQ.

Deci and Ryan (1985) operationally defined motivation as the drive to satisfy and achieve internal goals that may not have external rewards (intrinsic satisfaction), and

Bandura (2002) provided another aspect to motivation, which is the desire to feel successful (self-efficacy). Ang et al. (2007) added intercultural settings to this list, and together these formed the basis for motivational CQ. Ang et al. (2007) drew from Gudykunst et al. (1988) and Hall (1959) for the operationalization of behavioral CQ using Gudykunst et al. and Hall's definitions of intercultural nonverbal/verbal communication and behavioral flexibility, respectively. Additionally, Ang et al. (2007) interviewed eight executives with global experience to qualitatively test the fit of each of the four dimensions of CQ (cognitive, metacognitive, motivational, and behavioral).

Following the guidance of Hinkin (1998) and Schmitt and Stults (1985) on creating a psychometric instrument, Ang et al. (2007) began with about twice as many items as they thought would ultimately be necessary while aiming not to fatigue participants. The authors hoped to have six items for each of the four dimensions (cognitive, metacognitive, motivational, and behavioral) and therefore began with 53 items. The authors described the items as short, direct, and grammatically positive (i.e., items avoided negation by words such as "not") to limit the production of artifacts. These items were presented to a panel the authors described as having "significant cross-cultural experiences." The panel consisted of three faculty members and three international executives, who independently assessed the items, which were presented in a random order. From these assessments, ten items per factor were retained, leaving 40 items on the survey. Ang et al. explained that the items were rated on a Likert scale (1 = very low quality; 5 = very high quality) for their clarity, readability, and definitional fidelity.

To test the factor-structure validity, Ang et al. (2007) recruited undergraduate students in Singapore as respondents. The authors applied confirmatory factor analysis specifically, the LISREL 8 implementation of maximum likelihood estimation and correlated factors) to the set of forty items to assess the goodness-of-fit of a four-dimension model and to identify a subset of items to retain. After verifying the overall model fit, they struck items until 20 remained, using high residuals, low factor loadings, small standard deviations, or extreme means, and low item-to-total correlations as criteria for deletion. The resulting instrument was the CQS, which has four items loading on metacognitive CQ, six on cognitive CQ, five on motivational CQ, and five on behavioral CQ. Each item is scored on a 7-point Likert scale (1= strongly disagree, 7 = strongly agree). The statistical validity, external validity, and generalizability of the CQS are further discussed in the section on threats to validity, and extensive details are available in the literature review.

In three separate samples for the self-report version Van Dyne et al. (2015) reported reliability indexed by Cronbach's α of .71-.78 for metacognitive CQ, .81-.85 for cognitive CQ, .75-.80 for motivational CQ, and .81-.84 for behavioral CQ. To test the factor-structure validity, Van Dyne et al. (2015) recruited sperate samples of respondents: sample one consisted of undergraduate students attending a university in Singapore (n= 576); sample two consisted of a non-overlapping group of undergraduate students attending a university in Singapore (n= 447); and sample three consists of a subset of the two previous samples of undergraduate students from Singapore (n= 204). In addition to being the most widely used measure of CQ the CQS is most appropriate for my research

because it measures the four dimensions of CQ being studied (cognition, metacognition, motivation, and behavioral) and has been validated for us with American populations by both Van Dyne et al. (2015).

Alexandra et al. (2021) whose population consisted of American graduate students (n= 925) used the latent change score modeling procedure to validate Ang et al. (2007) 20-itms scale consisting of four questions for four dimensions: cognitive, metacognitive, motivational, and behavioral. Ang et al.'s 20-items are identical to Van Dyne et al.'s, (2015) version of CQS that I used in this research. Van Dyne et al. nor Alexandra et al. detailed how long respondents would need to complete the self-report CQS. SurveyMonkey estimated that with the letter of invitation, informed consent, and the CQS it would take participants six minutes to complete.

Operationalization of Variables and Definitions

The CQS is intended to assess level of cultural intelligence for a specific definition of culture. Under this definition, culture is defined as the quality that provides the lens through which people perceive the world and influences the way they interpret and respond to external and internal stimuli. Culture encompasses ideas about race, ethnicity, nationality, religion, social class, privilege, socioeconomics. gender, values, disability, sexual orientation, traditions, language, and lifestyles (Roux & Suzuki, 2017). Culture is thus a foundational construct of identity that influences all aspects of life, both internal and external: self-worth, wellbeing, perception, social interactions, and judgments about safety (Excell**,** 2020). As defined by Van Dyne et al. (2015) cognitive CQ is the ability to acquire new knowledge about cultures such as language, customs, and

laws; metacognitive CQ is the ability to process cognitive CQ information and be aware when cultural information is being used; motivational CQ is the drive to acquire and process such knowledge; and behavioral CQ the ability to use the knowledge gained to create behaviors that are viewed as intelligent in the culture of context.

Van Dyne et al. (2015) retained 20 of the items because of their statistical properties. Each domain had items scored on the Likert (1 strongly disagree to 7 strongly agree). Analysis of responses confirmed a four-dimension model with related subscales (pairwise correlations of .21–.45) that had significant ($p < .05$) standardized factor loadings (.52–.80). As an example, here are items from each of the subscales: cognitive CQ "I know the legal and economic systems of other cultures", metacognitive CQ "I check the accuracy of my cultural knowledges as I interact with people from different cultures"; motivational I enjoy interacting with people from different cultures"; behavioral, "I alter my facial expressions when a cross-cultural interaction requires it." The Center for Cultural Intelligence calculates the low, moderate, and high scores as those in the bottom quartile, those in the two middle quartiles, and those in the top quartile, respectively, among the 150,000 individuals who had taken the CQS at the time of norming, done by calculation of quartile thresholds (Cultural Intelligence Center, 2019). None of the questions are reverse coded, and the scores are computed as the arithmetical averages for the individual dimensions and the sum of the averages for the overall score (Van Dyne et al., 2015). Scoring is discrete at the item level, and because a finite number of questions are present, is also discrete at the dimension and overall levels (Tabachnick & Fidell, 2007).

Data Analysis Plan

Hayes's (2018) PROCESS plugin for IBM SPSS was used to test for mediation, moderation, serial mediation, parallel mediation, and moderated moderation. Hayes provided instructions on how to use PROCESS for a variety of pre-defined path diagram models, and each of the above tests is described by one of Hayes's models. For the three simple moderation I used Hayes's Model 1, the moderated moderation I used Model 3, the two simple mediations I used Model 4, serial mediation I used Model 6, and parallel mediation I used Model 4. The input data were the answers to the CQS administered by Survey Monkey. Prior to the principal mediating and moderating analyses, data were cleaned and screened for missing item values, scale reliability, univariate normality, univariate and multivariate outliers, collinearity, multicollinearity; and preliminary regressions was run to examine the normality, linearity, homoscedasticity of residuals, and standardized residuals > 3.29 following standard practices (Diebold, 2019; Tabachnick & Fidell, 2007).

As part of cleaning the data, I removed surveys with missing answers for more than one of the items that make up each of the CQ scales from further analysis. This equates to having more than 20% missing data across the items that make up each scale. Participant-specific mean substitution (i.e., a participant's average response across the valid items of a scale), there were no surveys imputed with missing answers. I conducted reliability analysis for each of the four CQ scales to check for negatively correlated items. Reliability can be affected by univariate outliers, standardized *z*-scores exceeding ±3.29 and discontinuous with the sample distribution of which there were none.

I screened each initial CQ mean composite (or factor scores if warranted) as part of my examination for univariate outliers ($z > 3.29$ and discontinuous). I assessed multivariate outliers by Mahalanobis distance. I conducted Multivariate outlier screening by following Tabachnick and Fidell's (2007) procedure of regressing a random variable on all four CQ scale scores. I examined each CQ subscale score for univariate relative normality (skewness $\leq \pm 3.0$, kurtosis $\leq \pm 10.0$; Kline, 2016) and considered for transformation if substantially nonnormally distributed. Given the meta-analyses population estimates of correlations among the CQ dimensions reported by Rockstuhl and Van Dyne (2018), I did not expect collinearity or multicollinearity to affect the regression-based mediation and moderation results. Variance inflation factor values greater than 2.78 (equivalent to tolerance values < .36) can affect regression results. Based on Rockstuhl and Van Dyne's estimates of correlations among the CQ predictors, I expected variance inflation factor values less than 2.0.

I conducted preliminary regressions mimicking each of the mediated and moderating models to examine regression residuals for normality, linearity, homoscedasticity, and standardized residuals > ±3.29. I eliminated cases with standardized residuals exceeding ±3.29 and that were substantially discontinuous with the distribution from further analysis. After I cleaned the data, I conducted final reliability and descriptive statistics (mean, median, standard deviation, minimum and maximum values, skewness and kurtosis) analysis of the four CQ subscale scores, including a correlation matrix. I ran descriptive statistics for the final valid sample. I then used Hayes (2018) Process plug in for IBM SPSS.

Hayes (2018) PROCESS uses ordinary least squares regression to estimate variables' coefficients. For higher-order effects, each segment of the path was subjected to regression testing, and overall effects were described by using Monte Carlo bootstrapping to estimate confidence intervals. For mediation, simple, direct, and indirect effects was calculated using PROCESS as the total of the antecedent variable on the consequent variable (i.e., the simple effect) that was proportioned into a direct effect and an indirect effect through the mediator. I checked for simple moderation by examining how strongly the moderating variable affects the slope and direction of the correlation between the input and output variables. I probed for statistically significant interaction effects for differences in slope at ±1.0 standard deviations and I provided graphs in chapter four.

Hayes (2018) explained that for all higher-order relations, the indirect effects should be judged from bootstrap confidence intervals of the unstandardized regression coefficients. If the confidence interval contains 0, then the effect is not significant. Hayes argued that confidence-interval evaluation should be used instead of the older "Sobel" test for its greater accuracy and higher interpretability. Hayes was clear that each of the methods described have threats to validity and explains how to limit and overcome them, which will be discussed further in the section on threats to validity.

Research Questions

Mediation Research Questions

Research Question One: Paths $a_1d_{21}b_2$ (see Figure A1): To what extent does metacognitive CQ mediate the mediation of cognitive CQ's effect on behavioral CQ by motivational CQ?

Research Question Two: Paths $a_2d_{21}b_2$ (see Figure A2): To what extent does motivational CQ mediate the mediation of cognitive CQ's effect on behavioral CQ by metacognitive CQ?

Research Question Three: Path $a_1b_1a_2b_2$ (see Figure A3): To what extent do motivational CQ and metacognitive CQ, while controlling for each other, mediate the effect of cognitive CQ on behavioral CQ?

Research Question Four: Paths a_1b_1 (see Figure A4): To what extent does metacognitive CQ mediate the relation between cognitive CQ and behavioral CQ?

Research Question Five: Paths a_2b_2 (see Figure A5): To what extent does motivational CQ mediate the relation between cognitive CQ and behavioral CQ?

Moderation Research Questions

Research Question Six (see Figure A6): To what extent does motivational CQ moderate the moderation of cognitive CQ's effect on behavioral CQ by metacognitive CQ?

Research Question Seven (see Figure A7): To what extent does metacognitive CQ moderate the relation between cognitive CQ and behavioral CQ?

Research Question Eight (see Figure A8): To what extent does motivational CQ moderate the relation between cognitive CQ and behavioral CQ?

Research Question Nine (see Figure A9): To what extent does motivational CQ moderate the relation between metacognitive CQ and behavioral CQ?

Threats to Validity and Reliability

I used a quantitative, non-experimental, correlational research design and focused on the interrelations among four dimensions of CQ (cognitive, metacognitive, motivational, and behavioral). I used the CQS, which is a questionnaire instrument. What follows is a discussion of the validity and reliability of the CQS/ I included a discussion of statistical validity. I begin with validity and reliability.

Validity and Reliability of the Measurement

I used the CQS, which is a self-report survey with 20 items (4 items for metacognitive CQ; 6 items for cognitive CQ; 5 items for motivational CQ; and 5 items for behavioral CQ; Van Dyne et al., 2015). Van Dyne (2015) verified the CQS for use in multiple cultures. Answers are given on a 7-point Likert scale ranging from *strongly agree* to *strongly disagree.* Respondents were asked to take the survey, which was delivered via the SurveyMonkey online platform, once. Van Dyne et al. validated the CQS developed by Ang et al. (2004). Van Dyne et al. repeated the measures taken in Ang et al. (2007), as described in the methodology section, and validated the four-dimension model of CQ, which allowed reducing the 40-item version of the CQS developed by Ang et al. (2004). Although Van Dyne et al. validated the CQS, it was Ang and Van Dyne (2015) who discussed construct validity and the relevant knowledge and measures.

Construct Validity

Ang and Van Dyne (2015) explained that the four dimensions of CQ indicate abilities and capabilities. The authors further explained that abilities and capabilities are characteristics that allow individuals to perform and carry out behaviors. Ang and Van Dyne stated that CQ reflects a set of malleable abilities and capabilities that can be learned, in contrast with personality traits, which are fixed. Ang and Van Dyne explored construct validity by examining the CQS in relation to eleven other intercultural competency scales: the Culture Shock Inventory (Reddin, 1994); Culture General Assimilator (Cushner & Brislin, 1996); Global Awareness Profile Test (Corbitt, 1998); Multicultural Awareness-Knowledge-Skills Survey (D'Andre et al., 1991); Social Adaptation Scale (Ward & Kennedy, 1999); Cross-Cultural World Mindedness (Der-Karabetian, 1992); the Intercultural Adjustment Potential Scale (Matsumoto et al., 2001); the Cross-cultural Adaptability Inventory (Kelley & Meyers, 1995); Intercultural Development Inventory (Hammer & Bennet, 1998); Intercultural Sensitivity Inventory (Bhawuk & Brialin, 1992); Overseas Assignment Inventory (Tucker, 1999). Ang and Van Dyne found that two of the eleven scales they investigated, Cross-Cultural World Mindedness (Der-Karabetian, 1992) and the Intercultural Adjustment Potential Scale (Mastumotot et al., 2001) did not match the CQS because of a focus on personality and traits, rather than abilities. Ang and Van Dyne found that the nine other scales had aspects that supported the argument for the four-dimension model of the CQS and confirmed construct validity.

Specifically, the Culture Shock Inventory (Reddin, 1994), Culture General Assimilator (Cushner & Brislin, 1996), Global awareness Profile Test (Corbitt, 1998), Multicultural Awareness-Knowledge-Skills Survey (D'Andre et al., 1991), and Social Adaptation Scale (Ward & Kennedy, 1999) scores each had a positive correlation with cultural cognition, supporting the inclusion of cognitive CQ; the Cross-cultural Adaptability Inventory (Kelley & Meyers, 1995), Intercultural Development Inventory (Hammer & Bennet, 1998), and Multicultural Awareness-Knowledge-Skills Survey (D'Andre et al., 1991) each had aspects of cultural metacognition, supporting the inclusion of metacognitive CQ; the Culture Shock Inventory (Reddin, 1994) and Multicultural Awareness-Knowledge-Skills Survey (D'Andre et al., 1991) both had aspects of cultural motivation, supporting the inclusion of motivational CQ; and the Culture Shock Inventory (Reddin, 1994), Intercultural Development Inventory (Hammer & Bennet, 1998), Global awareness Profile Test (Corbitt, 1998), Intercultural Sensitivity Inventory (Bhawuk & Brialin, 1992), Overseas Assignment Inventory (Tucker, 1999), and Social Adaptation Scale (Ward & Kennedy, 1999) each had aspects of cultural behavior, supporting the inclusion of behavioral CQ. Ang and Van Dyne explained that the CQS provides more sensitive measurement of cultural capabilities and the ability to function in multicultural settings by drawing from multiple intelligences theory and measuring cultural cognition, metacognition, motivation, and behavior as dimensions. The authors stated that unlike the other scales discussed in this section, the CQS does not intermix ability and non-ability. Ang and Van Dynes pointed out that the measures discussed were not grounded in multiple intelligences theory. The authors stated that the

CQS was the "cleaner" measure of CQ in the real world because it is grounded in multiple intelligences theory and strictly tests CQ capabilities.

Van Dyne et al. (2015) conducted six additional studies related to the validity and reliability of the CQS. The first test addressed criterion validity and confirmed the findings of Ang et al. (2007). Both groups of authors tested the validity and reliability of the four-dimension model of CQ. Additionally, in the first study, Van Dyne et al., demonstrated convergent validity because their findings were related to the findings of Ang et al. Van Dyne et al. demonstrated content validity by proving that the CQS measures individuals' CQ, and face validity by demonstrating that the CQS was able to measure CQ. All of this was included in the first test, which described development of a 20-item scale to reduce response bias, test for internal consistency, and confirm the validity of the four-dimension model of CQ. The authors followed the steps described in Ang et al., which was explained in detail in the methodology section, and found the items to be internally consistent. They confirmed the validity and reliability of the four-dimension model of CQ.

In the first study, Van Dyne et al. started with 53 items, as Ang et al. (2007) had, with thirteen to fourteen items per CQ dimension. Van Dyne et al., like Ang et al., followed the guidance set by Hinkin (1998) and began with twice as many items as they thought would be sufficient and would not fatigue participants. Van Dyne et al. described the items as short, direct, and grammatically positive (i.e., items avoided negation by words such as "not") to limit the production of artifacts. As Ang et al. had, Van Dyne et al. presented the items to a panel described as having "significant cross-cultural

experiences." The panel consisted of three faculty members and three international executives; each member of the panel independently assessed the items, which were presented in a random order. From these assessments, ten items per dimension were retained, leaving 40 items on the survey. Van Dyne et al. then reduced these to 20 items via a specification search in which they deleted items with "high residuals, low dimension loading, small standard deviations or extreme means, and low item to item total correlation." The authors explained that the 20 items with the strongest psychometric properties remained: 6 for cognitive CQ, 4 for metacognitive CQ, 5 for motivational CQ, and 5 for behavioral CQ. The researchers used confirmatory factor analysis to characterize the goodness of fit for the remaining 20 items. The items were rated on a Likert scale (1 = very low quality; 5 = very high quality) for their clarity, readability, and definitional fidelity.

Van Dyne et al.'s (2015) second study focused on generalizability across samples and examined whether the CQS measured cultural intelligence across populations in the US and Singapore at various times. Participants were 447 undergraduate students in Singapore who had not participated in the first study. The authors used structural equation modeling to analyze goodness-of-fit and found that the four dimensions model had good internal consistency ($p < 0.05$), which extended and provided additional support for the study and the four-dimension model. In the third study, the researchers investigated generalizability across time, examining data from a subset of 204 participants of study two, who took the 20-item CQS a second time four months after the first time. The authors used confirmatory factor analysis with a covariance matrix to

explore longitudinal variance and to account for timewise correlated errors. The researchers conducted a correlated analysis with no restraints and found that the four-dimension model was consistent across time, produced consistent CQ scores, and had test–retest reliability. In study four, the authors tested generalizability across countries, using the results from 337 American students who were attending a large midwestern university and completed the 20-item CQS and from the 447 students in Singapore in study one. The authors assessed equivalence across countries using sequential model invariance for study one and study four, finding that the invariance never reached significance (p = ns), which demonstrated that the CQS was valid cross-culturally (specifically, for both Singapore and the United States).

In study five, Van Dyne et al.'s (2015) focused on generalizability across methods, with the use of an observer version and self-report measure of the CQS. The authors explained that in the observer version of the CQS, the "I" of each of the 20 questions was changed to "this person"; for example, "I know the legal and economic systems of other cultures" became "This person knows the legal and economic systems of other cultures." The authors assessed convergent and discriminant validity using multi-trait multi-method techniques designed to assess the answers provided by 142 students attending an executive MBA course at a large midwestern college. The authors also used confirmatory dimensions analysis to consider correlated traits, arguing that this would avoid common-method variance because different sources were used, and measurement was done by different methods. In the study, participants completed the CQS and then were randomly assigned a classmate, who filled out the observer CQS for that student.

The researchers explained that by using the multi-trait multi-method techniques in conjunction with confirmatory dimensions analysis, the degree of convergent and discriminant validity could be measured because each variable could be considered to be a function of trait, method, and errors dimensions. The technique allowed variance to be attributed to the listed inputs to the variance function. Using this technique, the authors found that the CQS had convergent, discriminant, and criterion validity across methods.

Van Dyne et al.'s (2015) sixth study focused on discriminant and incremental validity by having the 251 participants from study two and 249 participants from study four take a second questionnaire that measured cognitive ability, emotional intelligence, interactional adjustment, and mental wellbeing. The discriminant validity was assessed from the data of study six, using confirmatory factor analysis, and the results supported the distinctiveness of the four dimensions of CQ and the items designed to measure cognitive ability, emotional intelligence, interactional adjustment, and mental wellbeing. The researchers used hierarchical regression to measure incremental and predictive validity, finding that the CQS had discriminant, incremental, and predictive validity. Van Dyne et al. argued that the depth and breadth of their validation of the CQS demonstrated internal validity and that the instrument measures cultural intelligence in adults as well as proving that the CQS can be used with diverse populations.

Statistical Conclusion Validity

As discussed, I tested for the presence of mediation, moderation, serial mediation, parallel mediation, and moderated moderation in the pathway from cognitive to behavioral CQ by way of metacognitive and motivational CQ. The presence of such

relations would suggest a highly interrelated set of relations among the dimensions (Hayes, 2018). Ang et al. (2007) were the first to suggest that the four dimensions may be interrelated; however, Racicot and Ferry (2016) were the first to demonstrate that such a relation existed. Racicot and Ferry used the 20-item CQS to measure motivational and metacognitive CQ (Ang et al., 2007; Van Dyne et al., 2008). Hayes's (2013) conditional model was used to test whether the mediating effects of motivational CQ on interest in pursuing future work and study abroad opportunities were in turn mediated by metacognitive CQ and/or experienced gained from studying abroad. Racicot and Ferry began with a regression analysis of the relation between metacognitive CQ and motivational CQ. The authors regressed metacognitive CQ on motivational CQ with travel experience as a covariate and found that motivational CQ was a predictor of metacognitive CQ ($t = 3.28$, $p < .01$). The authors argued that motivational CQ may create the drive necessary to test out new knowledge and plans created by motivational CQ and that the two dimensions may act in a sequential way. The work of Racicot and Ferry demonstrated that metacognitive CQ mediated motivational CQ's mediation effects and that the two acted in a sequential manner, providing evidence that it is possible that metacognitive and motivational CQ could have a serial mediation or parallel mediation effect in the pathway from cognitive and behavioral CQ.

Gooden et al. (2017) found simple direct relation among the pairs of the four dimensions (cognitive, metacognitive, motivational, and behavioral). Barron and Kenny (1986) as well as Hayes (2018) would argue that the next step would be to test for simple mediation and moderation to better understand when, how, and why CQ effects occur and

the relation between the dimensions. In my research, I tested for simple relations, as described by Hayes (2019), meaning one mediator and one moderator between all four dimensions. Chua and Ng (2017) further, supporting my research beyond simple mediation between the dimensions in their findings that there was a positive relation between metacognitive CQ and cognitive CQ and that metacognitive CQ mediated the relation between cognitive CQ and creativity, a type of behavior. Sharma (2019) found that relationship quality mediated the combined effect of cognitive and metacognitive CQ on institutional success (a form of behavior) and that cognitive and metacognitive CQ are interrelated. Sharma's results provide more support for the argument of interrelations and the need to test for mediation by demonstrating that both cognitive and metacognitive CQ's effects of behavior are mediated. Chua and Ng , as discussed throughout this proposal, also found cognitive CQ's relation with creativity is moderated by metacognitive CQ, demonstrating that metacognitive CQ moderates cognitive CQ's relation with a behavioral outcome, supporting my testing of simple moderation as described by Hayes (2018).

In further support of testing for simple moderation between dimensions, Şahin and Gürbüz (2017) found that cognitive, metacognitive, and motivational CQ positively moderated the relation between entrepreneurial orientation and international performance. This demonstrated that these dimensions have moderating effects, which supports my argument that they may have moderating effects on the simple relations found by Gooden et al. Awan et al. (2018b) found that metacognitive CQ and, separately, motivational CQ moderated the relation between contract governance and collaboration

such that when metacognitive CQ is high the positive relation between contract governance and collaboration (a type of behavior) is strengthened adding further support of my research.

Henderson et al. (2018) found that motivational CQ positively moderated the mediating effect of role clarity on the positive relation between communication norm alignment and job satisfaction as well as assignment-specific performance, demonstrating motivational CQ's ability to function as a moderator in higher-order relations. Hayes (2018) explained that higher-order relations involve multiple mediators, moderators, or moderation and mediation occurring simultaneously. Hayes (2018) argued that phenomena that function in multiple higher-order relations should be tested further because no researcher can test all possibilities. Following Hayes, because motivational CQ has functioned in a serial mediation relation (Racicot and Ferry, 2016) as well as in a moderated mediated relation (Henderson et al., 2018), it was scientifically sound to test for other higher-order relations, providing support for my testing of multiple mediatiors in the pathway from cognitive to behavioral CQ by way of metacognitive and motivational CQ.

In my research, I used the answers from the self-report 20-item CQS as the input and tested whether simple mediation, moderation, and the higher-order relations of serial mediation, parallel mediation, and moderated moderation exist among the dimensions. Henderson et al. (2018) demonstrated that Hayes and Rockwood's (2017) PROCESS method allowed for testing both mediation and moderation, supporting my argument that the Hayes PROCESS method is a valid statistical approach to test mediation and

moderation between the four dimensions of CQ (cognitive, motivational, metacognitive, and motivational). Racicot and Ferry (2016) and demonstrated that Hayes's (2013) PROCESS method can test higher-order relations, supported my argument that the PROCESS method would provide the means to adequately analyze data and provide good statistical conclusion validity.

Hayes (2018) explained that PROCESS applies ordinary least squares regression in the combinations necessary to examine all of the simple and higher-order relations that I tested in my research. Hayes explains that when sample sizes are not small, normality is not a threat to the validity of regression analysis. My sample size would need to be less than thirty to be considered small (Yang et al., 2019). Hayes (2018) PROCESS allows for the use of inferential methods to overcome any issues with homoscedasticity that may arise. In my research, the variables are independent and have been shown to form an independent type of intelligence (Ang et al., 2007). In addition to examining statistical conclusion validity, external validity, internal validity via instrumentation that details the validation of the CQS, I have also considered the ethics of my research.

Ethical Procedures

I used the SurveyMonkey online platform to deliver my survey and collect data. Individuals who signed up to take surveys on the SurveyMonkey website and fit my population parameters were notified of the opportunity to participate in my study by SurveyMonkey invitation. On my survey page my letter of invitation, informed consent, and exclusion questions preceded the CQS. Once the participants click to confirm that they had read the letter of invitation and informed consent they proceeded to the three yes

or no exclusion questions. SurveyMonkey compensates survey takers a small amount depending on the survey length, and no additional incentives were offered. As part of informed consent, the participants were notified that they could stop taking the survey at any time and were allowed to skip questions. Rice et al. (2017) argued that generalizability is increased when using an online survey delivery service such as SurveyMonkey or Amazon MTurk with a large population pool because the diversity in population increases generalizability.

All data were collected by SurveyMonkey and kept anonymous. SurveyMonkey (2021c) details how they keep all survey data anonymous, which aligned with my anonymous research design. I asked respondents their age, gender, education level, type of education (accredited vs. homeschooled), if they identify as an English speaker, and country of residence to ensure that they live in the United States because I am not conducting international research. I am keeping data stored in two places: first, on the data-as-collected in my private SurveyMonkey account for 90 days after the certification that I have met the requirements to earn my PhD after which I will delete it from the SurveyMonkey; second, the exported data as an SPSS file in encrypted-at-rest cloud storage for five years after the completion of my PhD.

As detailed on SurveyMonkey's (2021c) website, I was able to determine who had access to my data. I limited access to myself, my Chair, and Committee Member(s). Because I did the survey though SurveyMonkey, I did not know the participants, so there is no risk of power differential with participants, and I did not offer any incentives outside of what SurveyMonkey ordinarily pays participants. Because participants were

able to skip questions, choose not to participate in the research, and still be designated as having completed the survey, there is no risk of lost compensation or incentives provided by SurveyMonkey (2021c).

As part of the ethical procedures, I submitted my research plan, the Cultural Intelligence Scale survey, the SurveyMoney recruitment procedure, the informed consent information, and the letter of invitation to Walden's Independent Review Board on October 10, 2021. I was notified of the Institutional Review Board (IRB) approval of my application for this study entitled, "The Relations Among Cultural Intelligence Dimensions in Adult SurveyMonkey Audience Members" on November 24, 2021. My approval number is 11-24-21-0241731. My institutional review board approval expires on November 23, 2022. On December 10, 2021, I submitted a request for a change in procedures before launching my survey, because I had not included in my original informed consent information on mental health support and I had an error in my letter of invitation, as well as changing the SurveyMonkey plan I was using. I switched from the Enterprise plan to the single survey plan. I switched plans due to the Enterprise plan being a year-long multiple survey plan. I will not be launching multiple surveys over the year. I launched a single survey that met all of my research needs. On December 21, 2021, I was notified via email by Elyse V. Abernathy, MSL, MSM (my designated research ethics support specialist) that my request for change in procedure was approved and I was clear to launch my survey and begin collecting data.

SurveyMonkey added demographic questions not included in my letter of invitation. On December 22, 2021, I attended the IRB office hours and was informed by

Dr. Gjellstad that could simply delete the questions as they were at the end of my survey and did not impact the surveys anonymization. The five multiple choice questions and answer options were: type of device used with the response options being iOS Phone / Tablet, Android Phone / Tablet, Other Phone / Tablet, Windows Desktop / Laptop, MacOS Desktop / Laptop, and other; household income with the response options of 0-9,999; 10,000-24,999; 25,000-49,999; 50,000-74,999; 75,00-99,999; 100,000-124,999; 125,000-149,999; 150,000-174,999; 175,999-199,999; 200,000+, prefer not to answer; region in the U.S. which the response options of: East Northern Central, East South Central, Middle Atlantic, Mountain, New England, Pacific, South Atlantic, West North Central, West South Central; gender with the response options of Male or Female; age with the response options of <18; 18-29; 30-44, 45-60, and >60.

Dr. Gjellstad emailed the IRB as did I and on December 23, 2021, I received permission to process the data received from SurveyMonkey and to delete the questions as part of cleaning the data. Once the demographic questions asked by SurveyMonkey were deleted my data matched the IRB approved data collection procedure and the letter of introduction (appendix D). I chose the SurveyMonkey platform for my survey to improve the diversity of the respondent group, and the safeguards detailed previously were provided by the platform (SurveyMonkey, 2021c). I chose to research the interrelations between CQ dimensions because a world with more cross-cultural compassion and understanding would be safer, more productive, and would save lives (Hani et al., 2020; Vlajčić et al., 2019).

Summary and Conclusion

Cultural intelligence (CQ) impacts every aspect of human life, and a lack of CQ creates revenue losses and loss of life due to an inability to communicate across cultural lines (Golestaneh et al., 2020; Hani et al., 2020; Kwantes & Glazer, 2017; Vlajčić et al., 2019). Ang et al. (2007) argued that the next step in CQ research should be the exploration of boundary conditions, such as CQ antecedents. The boundary conditions that inhibit, activate, or encourage CQ's effects on other phenomena have been well studied (Alexandra et al., 2021; Korzilius et al., 2017; Ott & Michailova, 2018;). The rationale of my quantitative research design was to fill the gap in the literature regarding which (if any) relations, particularly mediating, moderating, serial mediation, parallel mediation, and moderated moderation relations, existed among the four dimensions (cognitive, metacognitive, motivational, and behavioral) of CQ for the purpose of further developing the nomological network described by Rockstuhl and Van Dyne (2018).

For analysis, I used the Hayes (2018) PROCESS method, via a plugin for IBM SPSS, to tested for mediation, moderation, serial mediation, parallel mediation, and moderated moderation among CQ dimensions as operationalized via the CQS self-report English version approved for use with English-speaking adults in multicultural settings and validated by Van Dyne et al. (2015). I obtained an adequate sample of 225 responses via convenience sampling from the SurveyMonkey audience. Participants were limited to those with a diploma from an accredited four-year high school, who are 18 years or older, identify as English speakers, and lived in the United States at the time of taking the

survey (regardless of citizenship). Informed consent information, survey participation, and results from the survey answers were delivered via the SurveyMonkey platform.

I exported the answers to the survey questions (the data) and inputted them into IBM SPSS and used Hayes's (2018) PROCESS plugin, which uses ordinary least squares regression to estimate variables to test for mediation, moderation, serial mediation, parallel mediation, and moderated moderation. I subjected each segment of the path to regression testing, and the overall effects were described by using Monte Carlo bootstrapping to estimate confidence intervals (Hayes, 2018). Hayes argued that confidence-interval evaluation should be used instead of the older "Sobel" test for greater accuracy and higher interpretability. I calculated mediation effects using PROCESS as the total effect of the mediating variable on the relation between the input and output variables. Using PROCESS, I tested simple moderation by examining how strongly the moderating variable (metacognitive or motivational CQ) affects the slope and direction of the correlation between the input (cognitive; metacognitive CQ) and output (behavioral CQ) variables.

Chapter 4: Results

I designed my research to expand the CQ nomological network and fill a gap in the literature by testing for more than simple direct relations among the CQ dimensions (Gooden et al., 2017; Rockstuhl & Van Dyne, 2018; Ott & Michailova, 2018). Supported by the existing literature on CQ, I tested for simple mediation and moderation as well as the higher-order relations of serial mediation, parallel mediation, and moderated moderation between the CQ dimensions (Ang et al., 2007; Chua & Ng, 2017; Hayes, 2018; Henderson et al., 2018; Racicot & Ferry, 2016; Sharma, 2019; Soga, 2019). My data were gathered via the SurveyMonkey platform with SurveyMonkey Audience panel members completing Van Dyne et al.'s (2015) CQS. Once the data were cleaned there was an adequate sample of $N = 225$. In this chapter, I provide a comprehensive review of the population, data collection, data preparation, descriptive statistic results, and inferential statistic results.

Demographics

My sample was a convenience sample of 264 SurveyMonkey Audience members who were 18 years of age or older, lived in the United States, and identified as English speakers. Of the 264 surveys submitted by respondents, 39 surveys were excluded during data cleaning as described below. After cleaning, a sample of 225 remained (42.05% men, 57.95% women). SurveyMonkey divides the United States into nine regions. Of the 225 respondents whose surveys were retained, 9.26% were from east north central, 7.31% from east south central, 12.31% from mid-Atlantic, 8.46% from mountain, 6.54% from New England, 20.77% from Pacific, 15.77% from south Atlantic, 3.85% from west north

Central, and 15.38% from west south central. SurveyMonkey does not provide a demographic breakdown of its audience panel by region or a specific number of for how many of their audience members live in the United States. To improve the generalizability of my study, future researchers should use populations that include members who are not American and speak languages other than English (see Rice et al., 2007).

Data Collection

Data collection began December 21, 2021 and was completed December 22, 2021. Recruitment of participants and delivery of the CQS was done exclusively via the SurveyMonkey platform. In all, 267 SurveyMonkey Audience members completed the survey. Once the surveys were screened, an adequate sample of 225 remained. The data are the completed CQS answers.

Data Preparation

I exported the data from the SurveyMonkey platform to an encrypted IBM SPSS file. Data preparation began with cleaning and screening for missing item values, then I proceeded to checking initial scale reliability, screening, and removing all univariate and multivariate outliers, testing for collinearity, and multicollinearity, then running preliminary regressions to examine the normality, linearity, homoscedasticity of residuals, and standardized residuals > 3.29, following standard practices (Diebold, 2019; Tabachnick & Fidell, 2007).

Missing Data

SurveyMonkey, as part of the individual survey plan and survey logic, screened out participants who did not meet the following requirements: being 18 years or older and living in United States at the time of participation, identifying as an English speaker, having graduated from an accredited high school, and having answered all questions. Of the 227 responses, a total of 255 survey responses meeting these criteria were exported into IBM SPSS for further screening. SurveyMonkey added five additional questions at the end of my survey without my consent. The questions added by SurveyMonkey were number twenty-four through twenty-eight. Question twenty-four was labeled device type. Question twenty-five was labeled household income. Question twenty-six was labeled region. Question twenty-seven was labeled gender. Question twenty-eight was labeled age. Per IRB instructions after consultation, answers to questions twenty-four through twenty-eight were deleted as part of cleaning. Surveys with missing data ("Prefer not to answer" answers were counted as missing data) on any of the CQ questions were eliminated from further analysis by hand and the correctness of the removals was checked with IBM SPSS's "Select Cases" tool. None of the 233 remaining surveys had any missing responses. There was not a need for participant-specific mean substitution (because no retained cases were missing any answers), and therefore no data were imputed. Once the data were cleaned for missing values a sample of $N = 233$ was retained. The data set was then screened for reliability.

Reliability

Reliability analysis was conducted on the sample of $N = 233$ for each of the four CQ subscales. Cognitive CQ had a Cronbach's α of .929 and correlations among items were positive, in the range of .627 to .799. Metacognitive CQ had a Cronbach's α of .842 and correlations among items were positive, in the range of .504 to .697. Motivational CQ had a Cronbach's α of .873 and correlations among items were positive, in the range of .442 to .671. Behavioral CQ had a Cronbach's α of .879 and correlations among items were positive, in the range of .513 to .685. Because no scale had a Cronbach's α less than .70, there was not a need at this stage to assess item-level univariate outliers or conduct principal-axis factor analysis to check for multidimensionality or to use factor scores instead of the mean composite score (Diebold, 2019; Tabachnick & Fidell, 2007). Each scale had a Cronbach's α of at least .70 and (as expected) the pairs of scales were not negatively correlated, so scale reliability was accepted as good (Rockstuhl & Van Dyne, 2018). The results of collinearity testing are discussed in the section dedicated to collinearity and multicollinearity. Following reliability testing, the subscales were tested for univariate and multivariate outliers as discussed in the next section.

Univariate and Multivariate Outliers

Once data were tested for reliability, I tested the sample of complete answers ($N = 233$) for univariate outliers using the *z*-scores of the CQ dimensions. Each dimension's score was found for each case by simple averaging of the scores on the questions associated with the dimension. The means and standard deviations of the distributions of these composite scores were then calculated. Cases were checked for cognitive,

metacognitive, motivational, or behavioral CQ values with a *z*-score exceeding ±3.29. No univariate outliers were identified or removed as a result.

To detect multivariate outliers, the Mahalanobis distance was tested. The distances were generated for each subset of dimension scores for each case, and the cutoffs were set according to the 95% confidence level for the appropriate chi-squared test (*df* = number of loaded questions – 1). Outliers identified in this way were iteratively removed, checking for univariate outliers and re-calculating the Mahalanobis distance after eliminating discovered outliers. This process converged to a sample with $N = 228$ and no univariate or multivariate outliers. Two additional cases were eliminated under the advice of my second committee member, Dr. Diebold. These cases were found using case-wise diagnostics of the residuals later in the data analysis and are mentioned there. After removing the additional two outliers, I re-calculated the Mahalanobis distance, and one additional outlier was found. The finalized data set retained had $N = 225$ cases.

Analytic Assumptions

Because I used the Hayes PROCESS add-on for IBM SPSS, only the conventional assumptions of linearity, normality, and homoskedasticity were needed for mediation analysis, and bootstrapping makes these assumptions less important, particularly homoskedasticity (Hayes, 2018). For serial mediation models, it is assumed that a single or multiple mediators influence other mediators. In my research, it was assumed that the mediator motivational CQ would influence the mediator metacognitive CQ. For the parallel mediation models, it was assumed that no mediator influenced any other mediator, which is enforced by the model construction. For all moderation models,

Hayes allows relaxation of the standard assumption that the moderators are categorical, which permits examination of the subscale scores as moderators.

Normality of Distribution

To test the distribution of each of the four subscales relative to the regression to be checked, I used partial regression plots (for all but behavioral CQ) and a partial residual plot (for CQ). There were no deviations from the normal distribution. The quantiles of all four subscales were in line with the theoretical normal quantiles. All four subscales followed a straight line on the plot indicating normal distribution, as seen in Figures A10–A13. Additionally, all four dimensions had skewness ≤ ± 3.0, and kurtosis ≤ ± 10.0, indicating no problems with normality within the scales themselves (Kline, 2016).

Collinearity and Multicollinearity

When checking collinearity from the inter-item correlation matrix, all correlations were positive, in the range .455 to .708. Collinearity was not substantial because no pair of predictors were correlated at about .80. The variance inflation factor was used to check for multicollinearity. There were no variance inflation factor values greater than 2.78 (equivalent to tolerance values < .36) between subscales, indicating no issues with multicollinearity.

Solution Outliers and Residuals

Initial regressions were performed for each of the research questions to check for any issues with univariate or multivariate outliers and for collinearity and multicollinearity. Residual analyses were performed, and two cases were identified for removal, leaving $N = 225$ All data reliability steps were re-checked after these removals,

and one additional multivariate outlier was found from its Mahalanobis distance, leaving $N = 225$ cases. Another check of all tests found no additional outliers. After outlier removal, partial regressions and partial residuals were graphed to check for issues with normality, linearity, and homoscedasticity of the finalized dataset. These tests showed no problems, as seen in Figures A10–A13.

Descriptive Statistic Results

In this study, I examined mediation, moderation, serial mediation, parallel mediation, and moderated moderation among the four CQ dimension as they relate to expanding the CQ nomological network and to fill a gap in the research on interactions among the dimensions (Racicot & Ferry, 2016; Rockstuhl & Van Dyne, 2018; Sharma, 2019). The means and standard deviations were within expectations. As discussed, I began by cleaning the data and an adequate sample of $N = 225$ was retained. In this section, I discuss the reliability of the scale and subscales and present the descriptive statistics of the final sample of $N = 225$. I begin with a discussion of the reliability of the final sample $N = 225$ and each subscale, including minimum and maximum correlation ranges for $N = 255$ correlation matrix, and subscales inter-item correlation. This is followed by a discussion of the descriptive statistics including the mean, standard deviation, minimum, maximum, skewness, and kurtosis.

Subscale Reliability and Correlations

Table 3 contains Cronbach α values for each CQ subscale, the correlations and two-tailed *p* values among the subscales, and the average, minimum, and maximum inter-item correlations within each subscale. All four subscales had good to excellent

reliability, ranging from .83 to .93, with large inter-item correlations. All pairwise correlations among the subscales were statistically significant at $p < .001$, ranging from .46 to .71.

Table 3

Subscale Reliability and Correlations

	Subscale reliability & correlations				Inter-item correlations		
Subscale	1	2	3	4	Avg	Min	Max
1. Metacognitive	*.83*					.48	.64
2. Cognitive	.46	*.93*				.64	.80
3. Motivational	.70	.61	*.86*			.42	.65
4. Behavioral	.66	.56	.71	*.87*		.49	.69

Note. Main diagonal contains Cronbach α values; upper diagonal contains Pearson correlation values.

Descriptive Statistics

Table 4 contains descriptive statistics for each CQ subscale. Each CQS item has a 1 (*strongly disagree*) to 7 (*strongly agree*) Likert-type response scale (Van Dyne et al., 2015). Mean composite scores were calculated with the same 1–7 possible range of scores. All subscale scores were within normal skewness and kurtosis distribution standards and had adequate variance for statistical analysis. The cognitive CQ mean was near the 4.0 midpoint of the response scale and had the largest variance. Variances for the other three subscales were relatively the same and means were well above the midpoint, with metacognitive CQ having the highest mean of 5.31. No demographic information was collected, so there are no descriptive statistics to report to describe the respondents.

Table 4

Subscale Descriptive Statistics

	Min	Max	*M*	*SD*	Skewness	Kurtosis
Metacognitive	1.50	7.00	5.31	1.16	-.43	-.25
Cognitive	1.00	7.00	4.05	1.49	-.01	-.69
Motivational	1.40	7.00	4.96	1.20	-.21	-.27
Behavioral	1.00	7.00	4.75	1.25	-.37	.20

Inferential Statistics Results

This research was conducted to fill a gap in the research regarding what if any mediating, moderating, serial and parallel mediation exists between the dimensions of CQ (Van Dyne et al., 2018). In this section I report the results for all of the tests run to answer my research questions. Research questions one and two focus on serial mediation, question three on parallel mediation, and questions four and five on simple mediation. My research question six concerns moderated moderation and questions seven, eight, and nine concern simple moderation. All my results were found using the appropriate model of the PROCESS plugin as described in Hayes (2018).

Mediation Models

The five research questions related to mediation were as follows.

Research Question One: Paths $a_1d_{12}b_2$ (see Figure A1): To what extent does metacognitive CQ mediate the mediation of cognitive CQ's effect on behavioral CQ by motivational CQ?

Research Question Two: Paths $a_2d_{21}b_2$ (see Figure A2): To what extent does motivational CQ mediate the mediation of cognitive CQ's effect on behavioral CQ by metacognitive CQ?

Research Question Three: Path $a_1b_1a_2b_2$ (see Figure A3): To what extent do motivational CQ and metacognitive CQ, while controlling for each other, mediate the effect of cognitive CQ on behavioral CQ?

Research Question Four: Paths a_1b_1 (see Figure A4): To what extent does metacognitive CQ mediate the relation between cognitive CQ and behavioral CQ?

Research Question Five: Paths a_2b_2 (see Figure A5): To what extent does motivational CQ mediate the relation between cognitive CQ and behavioral CQ?

Tables 5–10 summarize the outcomes and regression parameters for research questions 1–5. For research questions 1–3, because they used the same set of variables, 57.9% of the variation in behavioral CQ scores was explained, and all paths were statistically significant at $p < .001$, except for research question 1, the path from cognitive CQ to metacognitive CQ. For research questions 4 and 5, examining the mediating effect of metacognitive and motivational CQ, respectively, all paths were statistically significant at $p < .001$ and, overall, accounted for 52.2% and 52.8%, respectively, of the variance in behavioral CQ scores.

Table 5 summarizes the total, direct, and indirect effects of each of the five mediating models. The coefficients are seen in Tables 6 through 10.

Table 5

Regression Model Summaries of Mediating Effects on Behavioral CQ

Model	*Effect*	*SE*	*p*	95% CI Lower	95% CI Upper
RQ1: Cognitive*Metacognitive*Motivational					
$R^2 = .377$, $F(1, 223) = 135.0$, $p < .001$					
Direct Effect	0.16	.05	< .001	0.07	0.25
Indirect Effect	.31	.04		0.24	0.40
Total Effect	0.47			0.31	0.65
RQ2: Cognitive*Metacognitive					
$R^2 = .21$, $F(1, 223) = 58.1.2$, $p < .001$					
Direct Effect	0.16	.05	<.001	0.07	0.25
Indirect Effect	0.31	.04		0.23	0.39
Total Effect	0.47			0.30	0.64
RQ3: Cognitive*Motivational					
$R^2 = .21$, $F(1, 223) = 135.0$, $p < .001$					
Direct Effect	0.16	.05	<.001	0.07	0.25
Indirect Effect	0.31	.04		0.23	0.40
Total Effect	0.47			0.30	0.65
RQ4: Metacognitive*Motivational					
$R^2 = .21$, $F(2, 222) = 121.4$, $p < .001$					
Direct Effect	0.28	.04	<.001	0.19	0.36
Indirect Effect	0.20	.04		0.13	0.27
Total Effect	0.48			0.32	0.63
RQ5: Metacognitive*Motivational					
$R^2 = .38$, $F(1, 223) = 135.0$, $p < .001$					
Direct Effect	0.17	.05	<.001	0.07	0.27
Indirect Effect	0.30	.04		0..23	0.38
Total Effect	0.47			0.30	0.65

Note. SE is the standard error for the direct effects and the bootstrapped standard error (5000 samples) for indirect effects.

Table 6

Summary of Path Statistics and Results for Research Question 1

Path	*B*	Std. Error	*t*	*p*	Bootstrap 95% CI	
					Lower Bound	Upper Bound
COG -> MOT	.6141	.0428	15.9369	<.0001	.4130	.5818
COG -> MCOG	.0450	.0478	.7370	.4619	-.0590	.1294
MOT->MCOG	.6672	.0590	10.9238	<.0001	.5283	.7609
COG->BEH	.1893	.0467	3.4177	.0008	.0675	.2515
MOT->BEH	.3730	.0714	5.4386	<.0001	.2475	.5287
MCOG->BEH	.3152	.0655	5.1857	<.0001	.2104	.4684
COG->MOT->BEH	.2291	.0460*			.1391	.3200
COG->MCOG->BEH	.0142	.0188*			-.0225	.0522
COG->MOT->MCOG->BEH	.1292	.0303*			.0755	.1914

Note. b is the standardized coefficient with mean centering. Significance is determined from the CI, which is not standardized. *: Std. Error was found by bootstrapping (5000 samples).

Table 7

Summary of Path Statistics and Results for Research Question 2

Path	*b*	Std. Error	*t*	*p*	Bootstrap 95% CI	
					Lower Bound	Upper Bound
COG -> MCOG	.4547	.2015	19.1945	<.0001	3.4702	4.2643
COG -> MOT	.3758	.0389	7.8351	<.0001	.2278	.3810
MCOG->MOT	.5240	.0496	10.9238	<.0001	.4445	.6402
COG->BEH	.1893	.0467	3.4177	.0008	.0675	.2515
MCOG->BEH	.3152	.0655	5.1857	<.0001	.2104	.4684
MOT->BEH	.3730	.0714	5.4386	<.0001	.2475	.5287
COG->MCOG->BEH	.1433	.0346*			.0801	.2161
COG->MOT->BEH	.1402	.0332*			.0782	.2084
COG->MCOG->MOT->BEH	.0899	.0227*			.0494	.1374

Note. b is the standardized coefficient with mean centering. Significance is determined from the CI, which is not standardized. *: Std. Error was found by bootstrapping (5000 samples).

Table 8

Summary of Path Statistics and Results for Research Question 3

Path	*b*	Std. Error	*t*	*p*	Bootstrap 95% CI	
					Lower Bound	Upper Bound
COG -> MCOG	.4547	.2015	19.1945	<.0001	3.4702	4.2643
COG -> MOT	.6141	.0428	11.6192	<.0001	.4130	.5818
COG->BEH	.1893	.0467	3.4177	.0008	.0675	.2515
MCOG->BEH	.3152	.0655	5.1857	<.0001	.2104	.4684
MOT->BEH	.3730	.0714	5.4386	<.0001	.2475	.5287
COG->BEH (Direct)	.1595	.0467	3.4177	.0008	.0675	.2515
COG->MCOG->BEH	.1433	.0344*			.0801	.2149
COG->MOT->BEH	.2291	.0462*			.1413	.3213

Note. b is the standardized coefficient with mean centering. Significance is determined from the CI, which is not standardized. *: Std. Error was found by bootstrapping (5000 samples).

Table 9

Summary of Path Statistics and Results for Research Question 4

Path	*b*	Std. Error	*t*	*p*	Bootstrap 95% CI	
					Lower Bound	Upper Bound
COG -> MCOG	.4547	.2015	19.1945	<.0001	3.4702	4.2643
COG -> BEH	.3295	.2478	6.3265	<.0001	.1912	.3641
MCOG->BEH	.5107	.0561	9.8054	<.0001	.4394	.6604
COG->BEH (Direct)	.2776	.0439	6.3265	<.0001	.1912	.3641
COG->MCOG->BEH	.2322	.0386*			.1591	.3101

Note. b is the standardized coefficient with mean centering. Significance is determined from the CI, which is not standardized. *: Std. Error was found by bootstrapping (5000 samples).

Table 10

Summary of Path Statistics and Results for Research Question 5

Path	*b*	Std. Error	*t*	*p*	Bootstrap 95% CI	
					Lower Bound	Upper Bound
COG ->MOT	.6141	.0428	11.6192	<.0001	.4130	.5818
COG -> BEH	.2035	.0493	3.4810	.0006	.0744	.2685
MOT->BEH	.5834	.0608	9.9797	<.0001	.4870	.7267
COG->BEH (Direct)	.1715	.0493	3.4810	.0006	.0744	.2685
COG->MOT->BEH	.3582	.0412*			.2787	.4381

Note. b is the standardized coefficient with mean centering. Significance is determined from the CI, which is not standardized. *: Std. Error was found by bootstrapping (5000 samples).

For research questions 1–3, nearly two-thirds (66.30%) of the total effect on cognitive CQ on behavioral CQ was indirect. All indirect effects were statistically significant (95% CI did not contain 0), except for research question 1, the indirect effect through metacognitive CQ. For research question 1, the serial mediation of motivational→metacognitive accounted for 34.67% of all indirect effects (22.99% of total effect). Though the indirect effect through motivational was more substantial (61.50% of all indirect, 40.78% of total), metacognitive CQ did mediate the mediation of motivational CQ on the relation between cognitive CQ and behavioral CQ.

For research question 2, the order of the serial mediation was reversed: metacognitive→motivational. This serial mediation accounted for 23.87% of all indirect effects (15.83% of total effect) and the indirect effects through metacognitive and motivational CQ were substantial, accounting for 38.50% and 37.64%, respectively, of all indirect effects and about one quarter each of the total effect. Though the serial mediation of metacognitive→motivational accounted for the smallest proportion of indirect effects, motivational CQ did mediate the mediation of metacognitive CQ on the relation between cognitive CQ and behavioral CQ.

The parallel effects of metacognitive and motivational CQ were examined in research question 3. Motivational CQ accounted for 61.50% of the indirect effects (40.78% of total), while metacognitive CQ explained 38.50% of the indirect and 25.52% of total effect of cognitive CQ on behavioral CQ. Research questions 4 and 5 separately examined the mediating effect of metacognitive and motivational CQ, respectively. Taken by itself, mediation by metacognitive CQ accounted for 41.35% of the total effect,

and mediation by motivational CQ explained 63.77% of the relation between cognitive CQ and behavioral CQ. Across all five mediation models, motivational CQ was the key mediator—by itself, in parallel with metacognitive CQ, and in series with metacognitive CQ—in explaining the relation between cognitive CQ and behavioral CQ. Because the direct effect of cognitive CQ on behavioral CQ was statistically significant in all five models, each model partially mediated the relation between cognitive and behavioral CQ. To facilitate model comparisons, standardized path coefficients are reported in Figures 1–5, corresponding to research questions 1–5.

Figure 1

Serial Mediation Model for Research Question 1

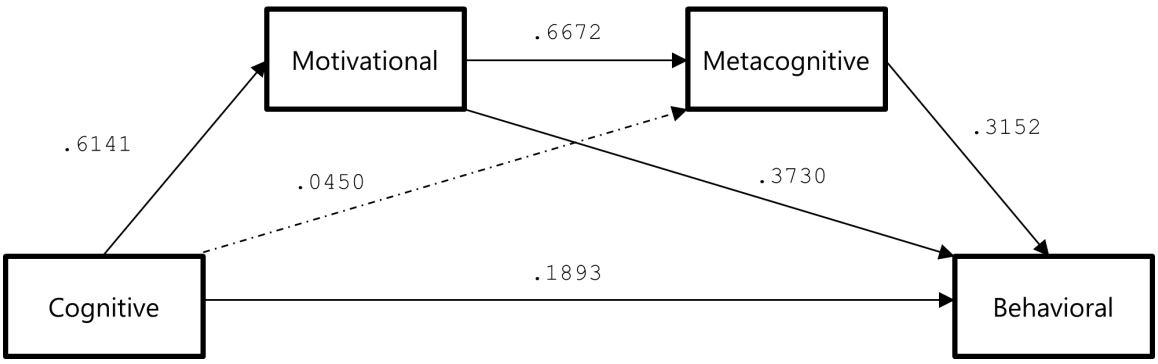


Figure 2

Serial Mediation Model for Research Question 2

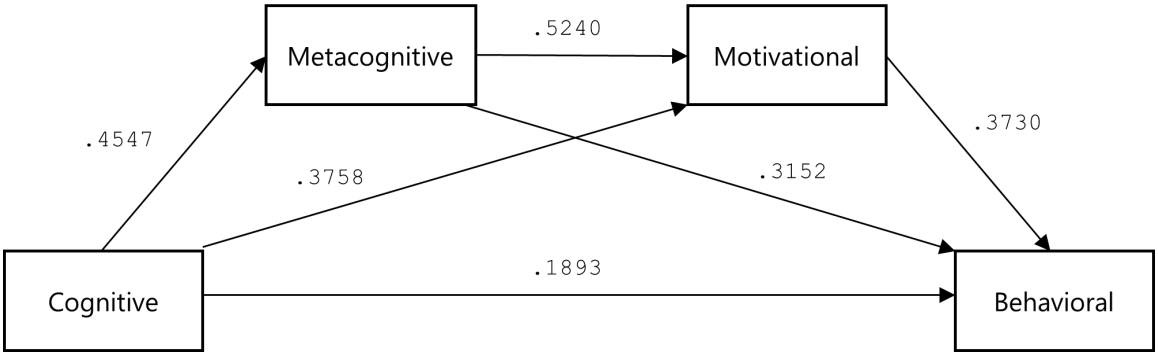


Figure 3

Parallel mediation for Research Question 3

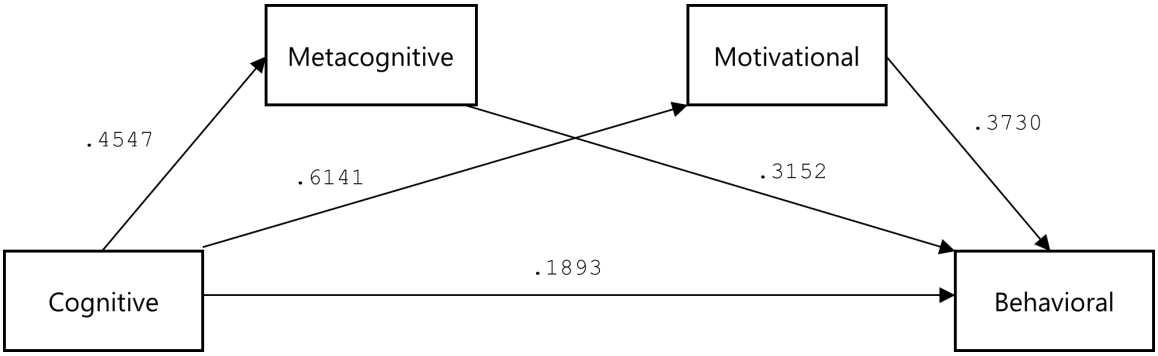


Figure 4

Mediation model for Research Question 4

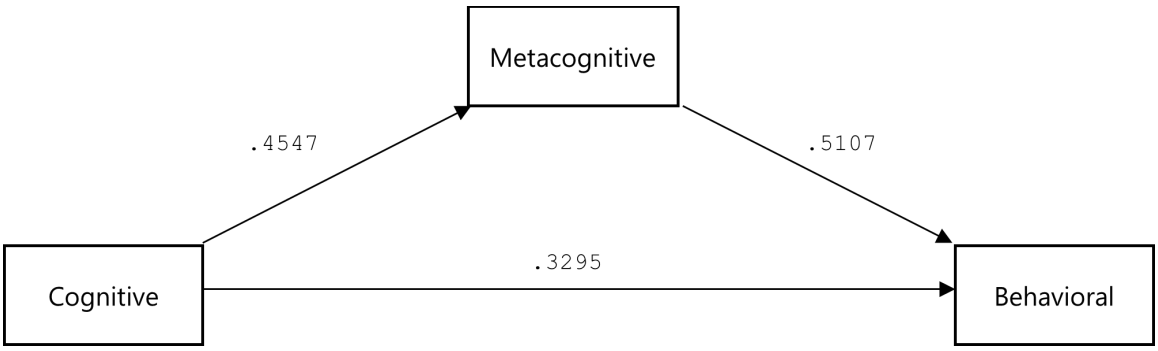
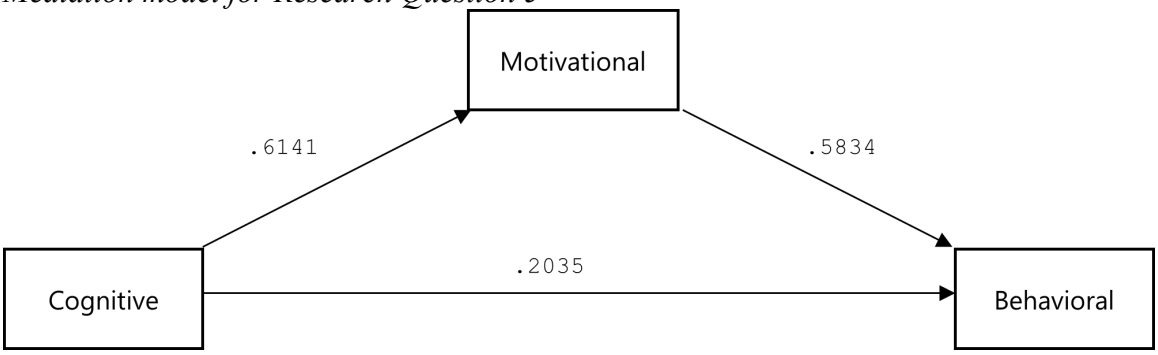


Figure 5

Mediation model for Research Question 5



Moderation Models

The following four research questions are related to moderation.

Research Question Six (see Figure A6): To what extent does motivational CQ moderate the moderation of cognitive CQ's effect on behavioral CQ by metacognitive CQ?

Research Question Seven (see Figure A7): To what extent does metacognitive CQ moderate the relation between cognitive CQ and behavioral CQ?

Research Question Eight (see Figure A8): To what extent does motivational CQ moderate the relation between cognitive CQ and behavioral CQ?

Research Question Nine (see Figure A9): To what extent does motivational CQ moderate the relation between metacognitive CQ and behavioral CQ?

Table 11 summarizes the regression results for research questions six, seven, eight, and nine. I used the Hayes (2018) PROCESS macro for IBM SPSS to test for moderated moderation (model 6 in Hayes; RQ 6) and for simple moderation (model 1 in Hayes; RQ7, RQ8, RQ9). All of the moderation research questions have the same output variable (behavioral CQ). Research questions six, seven, and eight have the same input variable (cognitive CQ) and different potential moderators. Research question nine's input variable is metacognitive CQ. For both moderated moderation and moderation, none of the models showed significant moderation, with the bootstrap confidence interval for all but one of the interaction effects including 0. When testing for moderated moderation (RQ6), the interaction Cognitive*Motivational had a confidence interval that did not include 0, indicating nominal significance at $p < .05$ ($p = .0289$). However, in the model for research question eight, this same interaction effect was not significant because the bootstrap confidence interval included 0 and $p > .05$ ($p = .4012$). Because research question eight uses a model with fewer terms, it would be expected that the interaction Cognitive*Motivational would be significant in this question if the result from research question six was not artifactual. This difference indicates there were no truly significant moderating relations found. I checked simple moderation by examining how strongly the moderating variable affects the slope and direction of the correlation between the input and output variables. Figure 6 depicts the slope for the moderation of cognitive CQ's effects on behavioral CQ by motivational CQ (RQ7). Figure 7 depicts the slope for

moderation of cognitive CQ's effects on behavioral CQ by metacognitive CQ (RQ8). Figure 8 depicts moderation of metacognitive effects on behavioral CQ by motivational CQ (RQ9).

Table 11

Regression Model Summaries of Moderating Effects on Behavioral CQ

Model	*b*	*SE*	*p*	95% CI Lower	95% CI Upper
RQ6: $R^2 = .59$, $F(7, 217) = 45.3$, $p < .001$					
Constant	4.75	.07	< .001	4.61	4.88
Cognitive	0.13	.05	.011	0.03	0.23
Metacognitive	0.28	.07	<.001	0.14	0.41
Motivational	0.39	.07	<.001	0.25	0.53
Cognitive*Metacognitive	-0.05	.05	.353	-0.15	0.05
Cognitive*Motivational	0.89	.04	.029	0.01	0.17
Metacognitive*Motivational	-0.05	.05	.320	-0.16	0.05
Cognitive*Metacognitive*Motivational	0.03	.02	.165	-0.01	0.07
RQ7: $R^2 = .52$, $F(3, 221) = 81.1$, $p < .001$					
Constant	4.78	.06	<.001	4.65	4.90
Cognitive	0.28	.04	<.001	0.20	0.37
Metacognitive	0.54	.06	<.001	0.43	0.66
Cognitive*Metacognitive	-0.03	.03	.370	-0.09	0.03
RQ8: $R^2 = .53$, $F(3, 221) = 82.7$, $p < .001$					
Constant	4.73	.07	<.001	4.59	4.86
Cognitive	0.17	.05	.001	0.07	0.26
Motivational	0.61	.06	<.001	0.49	0.74
Cognitive*Motivational	0.03	.03	.401	-0.03	0.08
RQ9: $R^2 = .56$, $F(3, 221) = 93.1$, $p < .001$					
Constant	4.79	.07	<.001	4.66	4.92
Metacognitive	0.34	.07	.001	0.21	0.48
Motivational	0.50	.06	<.001	0.37	0.63
Metacognitive*Motivational	-0.03	.04	.342	-0.10	0.04

Figure 6

Moderation of Cognitive CQ on Behavioral CQ at Different Levels of Metacognitive CQ

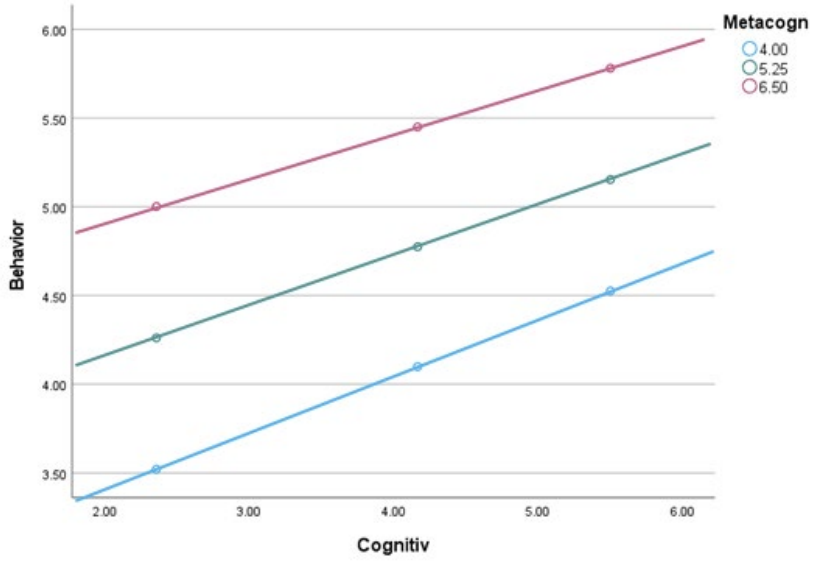


Figure 7

Moderation of CQ Effects on Behavioral CQ at Different Levels of Motivational CQ

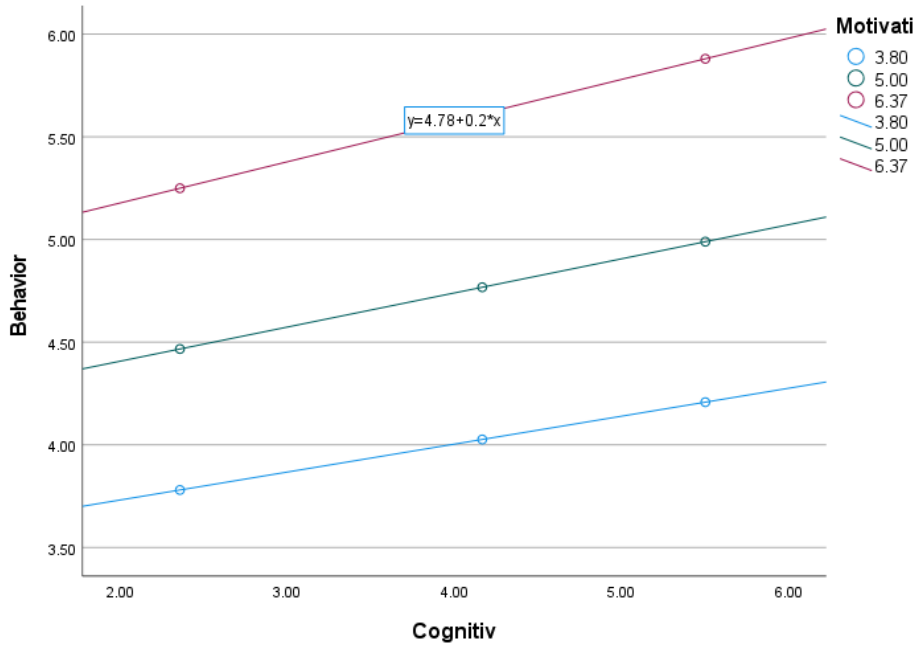
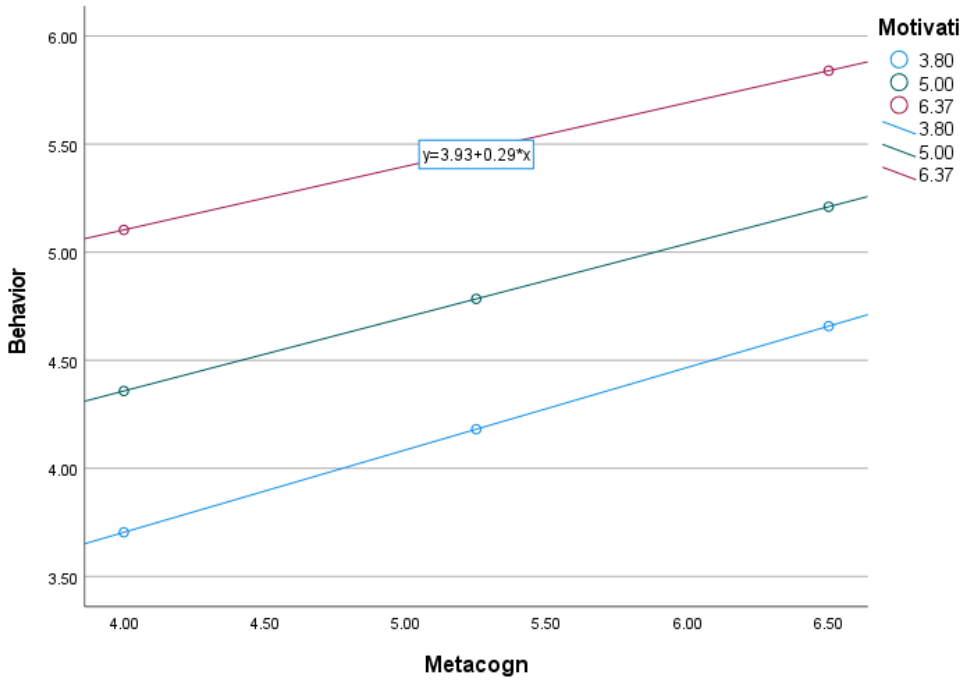


Figure 8

Moderation of Metacognitive Effects on Behavioral CQ at Different Levels of Motivational CQ



Summary

I cleaned and analyzed the data to answer my nine research questions concerning mediation, moderation, serial mediation, parallel mediation, and moderated moderation. The data inputted into SPSS from the SurveyMonkey platform were the 267 sets of responses to the CQS items. I cleaned the data by screening for missing item values, checking scale reliability, screening and removing all univariate and multivariate outliers, testing for collinearity, and multicollinearity, as well as running preliminary regressions to examine the normality, linearity, homoscedasticity of residuals, and standardized

residuals > 3.29, following standard practices (Diebold, 2019; Tabachnick & Fidell, 2007) an adequate sample of *N*=225 remained. After cleaning the data, I tested the reliability of the final sample and each subscale, including minimum and maximum correlation ranges for $N = 255$ correlation matrix, and subscales inter-item correlation. All four subscales had good to excellent reliability, ranging from .83 to .93, with large inter-item correlations. All pairwise correlations among the subscales were statistically significant at $p < .001$, ranging from .46 to .71. All subscale scores were within normal skewness and kurtosis distribution standards and had adequate variance for statistical analysis. I used the appropriate model of Hayes (2018) PROCESS plugin for IBM SPSS to test for mediation, moderation, serial mediation, parallel mediation, and moderated moderation.

Research questions one and two focus on serial mediation, question three on parallel mediation, and questions four and five on simple mediation. For research question one, the serial mediation of motivational→ metacognitive accounted for 34.67% of all indirect effects (22.99% of total effect). For research question two, the order of the serial mediation was reversed: metacognitive→motivational. This serial mediation accounted for 23.87% of all indirect effects (15.83% of total effect) and the indirect effects through metacognitive and motivational CQ were substantial, accounting for 38.50% and 37.64%, respectively, of all indirect effects and about one quarter each of the total effect. For research question three, the parallel mediating effects of motivational CQ accounted for 61.50% of the indirect effects (40.78% of total), while metacognitive CQ explained 38.50% of the indirect and 25.52% of total effect of cognitive CQ on

behavioral CQ. Research questions four and five separately examined the mediating effect of metacognitive and motivational CQ, respectively. Taken by itself, mediation by metacognitive CQ accounted for 41.35% of the total effect, and mediation by motivational CQ explained 63.77% of the relation between cognitive CQ and behavioral CQ. Because the direct effect of cognitive CQ on behavioral CQ was statistically significant in all five models, each model partially mediated the relation between cognitive and behavioral CQ.

With research question six, I focused on moderated moderation and with questions seven, eight and nine on simple moderation. All the moderation research questions have the same output variable (behavioral CQ). Research questions six, seven, and eight have the same input variable (cognitive CQ) and different potential moderators. Research question nine's input variable is metacognitive CQ. When testing for moderated moderation (RQ6), the interaction Cognitive*Motivational had a confidence interval that did not include 0 and $p < .05$ ($p = .0289$). However, in the model for research question eight, this same interaction effect was not significant because the bootstrap confidence interval including 0 and $p > .05$ ($p = .4012$). Because research question eight has the model with fewer terms, it would be expected that the interaction Cognitive*Motivational would be significant in this question if the result from research question six was not artifactual. This difference indicates there were no truly significant moderating relations found, because all other interactions the bootstrap confidence interval included 0. In chapter five, I discuss the implications of my findings.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of my quantitative study was to determine whether there were mediating, moderating, serial mediating, parallel mediating, or moderated moderating relations among the four factors of CQ (cognitive, metacognitive, motivational, and behavioral). In Research Questions 1–5, I focused on simple, parallel, and serial mediation of the path from cognitive to behavioral CQ by metacognitive and motivational CQ. In Research Questions 6–8, I focused on moderation and moderated moderation of the path from cognitive to behavioral CQ by metacognitive and motivational CQ. In Research Question 9, I focused on the moderation of the path from metacognitive to behavioral CQ by motivational CQ. I used Hayes's (2018) PROCESS plugin for IBM SPSS to test for mediation, serial mediation, parallel mediation, moderation, and moderated moderation.

I tested Research Question 1 and found serial mediation in the path from cognitive to behavioral CQ by motivational and then metacognitive CQ. I tested Research Question 2 and found serial mediation in the path from cognitive to behavioral CQ by metacognitive and then motivation CQ. Next, I tested Research Question 3 and parallel mediation. I found that motivational and metacognitive CQ, while controlling for each other, mediate the effect of cognitive CQ on behavioral CQ. I wrapped up testing for mediation by testing Research Questions 4 and 5. I found that metacognitive CQ mediated the relation between cognitive and behavioral CQ and that motivational CQ mediated the relation between metacognitive and behavioral CQ. Then, I focused on Research Questions 6–9 and tested for moderation and moderated moderation. I did not

find moderation or moderated moderation relations for the path from cognitive to behavioral CQ by metacognitive and motivational CQ. I also found no clear evidence that the path from metacognitive to behavioral CQ was moderated by motivational CQ.

The results and implications of my research will be discussed more fully in the interpretations of my findings and implications sections of this chapter. In this chapter I will also explore the limitations of my work. One such limitation was my inability to explore every possible combination of relations between the four factors of CQ. Specifically, I did not explore whether cognitive or behavioral CQ have mediating or moderating effects in the relations between the factors. Another limitation was that my population came solely from the SurveyMonkey platform. The limitations of my study will provide the foundation for the recommendations section of this chapter, which will include a discussion of the next steps in CQ research and how my research provides empirical support for further exploration of interrelations between the factors. In the Recommendation section I include suggestions for researchers and developers of CQ training. The implications of my research and positive social change impact will be discussed in their own section of this chapter. The goal of my research was to provide information on how and under what circumstances CQ develops by studying interrelations between the factors. In the next section I interpret my findings.

Interpretation of Findings

My results provide empirical evidence regarding how the different domains of cultural intelligence interact, as suggested by Davidson and Downing (2006), which furthers the development and supports the validity of multiple intelligences theory.

Davidson and Downing argued that information on how intelligence domains interact would improve the validity and utility of multiple intelligences theory by providing empirical support that multiple forms of intelligence interact, how that interaction occurs, and the result of those interactions. In my research, I was able to demonstrate that motivational and metacognitive CQ are significant actors in the path from cognitive to behavioral CQ. I quantitatively demonstrated that both motivational and metacognitive CQ sequentially, in parallel, and individually mediate the path from cognitive to behavioral CQ.

Previously, Gooden et al. (2007) found simple relations between the factors. I built on the work of Gooden et al. by testing more complex relations such as mediation, moderation, serial mediation, parallel mediation, and moderated moderation. I also built on the work of Racicot and Ferry (2016) in which the authors suggested that there may be a serial mediating relation between motivation and metacognitive CQ. In my research questions 1–3, I tested whether motivational and metacognitive CQ had a serial mediating and/or a parallel mediating relation in the path from cognitive to behavioral CQ. For Research Questions 1–3, I found that 57.9% of the variation in behavioral CQ scores was explained, and nearly two-thirds (66.30%) of the total effect of cognitive CQ on behavioral CQ was indirect. For Research Question 1, the serial mediation of motivational→metacognitive accounted for 34.67% of all indirect effects (22.99% of total effect). Though the indirect effect through motivational was more substantial (61.50% of all indirect, 40.78% of total). For Research Question 2, the order of the serial mediation was reversed. This serial mediation accounted for 23.87% of all indirect effects

(15.83% of total effect) and the indirect effects through metacognitive and motivational CQ were substantial, accounting for 38.50% and 37.64%, respectively, of all indirect effects and about one quarter each of the total effect. This demonstrated that there are two causal chains in the path from cognitive to behavioral CQ: cognitive→ motivational →metacognitive →behavioral and cognitive→ metacognitive→ motivational→ behavioral.

Causal chains show that cognitive CQ increases motivational CQ, which in turn increases metacognitive CQ which then increases behavioral (Charalambous et al., 2019). Additionally, cognitive CQ increases metacognitive CQ, which in turn increases motivational CQ which then increases behavioral CQ (Hayes, 2018). This demonstrated that CQ develops in two distinct and sequential manners and builds on the work of Racicot and Ferry (2016) by demonstrating the motivational and metacognitive CQ have two significant serial mediating relations. This also supports Gooden et al.'s finding that individual with cognitive, metacognitive, and motivational CQ will have behavioral CQ. Additionally, this supports Rockstuhl and Van Dyne's (2018) assertion that metacognitive and motivation CQ are key actors in the ability of individuals to development intercultural skills (behavioral and latent CQ). Rockstuhl and Van Dyne (2018)found that the four dimensions had variations and overlap (shared variance). Shared variance is how much dimensions overlap in their capabilities and how much they differ or vary from one another, which is statistically observable (Kilby et al., 2015).

Rockstuhl and Van Dyne explained that the overlap between the dimensions (their shared variance) creates the fifth and unique dimension of latent (or general) CQ.

Rockstuhl and Van Dyne argued that metacognitive and motivational CQ are key actors in the development of latent CQ. To further examine metacognitive and motivational CQ's effects on the path from cognitive to behavioral CQ and to test Research Question 3, I focused on parallel mediation.

Parallel mediation controls for causal relations and in my research is used to test the indirect effects of motivational and metacognitive CQ on the path from cognitive to behavioral CQ while controlling for each of mediators' effects, creating distinct and separate paths (Hayes, 2018). I found that motivational CQ accounted for 61.50% of the indirect effects (40.78% of total), while metacognitive CQ explained 38.50% of the indirect and 25.52% of total effect of cognitive CQ on behavioral CQ. This shows that both paths cognitive→ metacognitive →behavioral and cognitive→motivational→ behavioral are significant. Although there is a significant difference between the mediating effects of motivational and metacognitive CQ, both effects are still significant (Charalambous et al., 2019). My finding of parallel mediation warranted further investigation, which I conducted by examining each dimension's moderating effects individually (see Hayes, 2018).

I tested whether motivation and metacognitive CQ individually mediate the path from cognitive to behavioral CQ. By doing so, I examined a more complex relationship than found in Gooden et al. (2007). Testing Research Question 4, I examined whether metacognitive CQ mediates the path from cognitive to behavioral CQ. I found that metacognitive CQ did mediate the path from cognitive to behavioral CQ and accounted for 41.35% of the total effect. Testing Research Question 5, I found mediation by

motivational CQ of the path from cognitive to behavioral CQ explained 63.77% of the relation between cognitive and behavioral CQ. Across all five mediation models, motivational CQ was the key mediator by itself, in parallel with metacognitive CQ, and in a causal series with metacognitive CQ, in explaining the relation between cognitive and behavioral CQ. This reflects the importance of motivational CQ in the path from cognitive to behavioral (Charalambous et al., 2019). This also reflects that motivational CQ is a significant actor in how cognitive CQ results in behavioral CQ (Hayes, 2018). A major criticism of Earley and Ang's (2003) CQ theory was the inclusion of motivational CQ as a separate domain which my research provides support for (Liao & Thomas, 2020a). This is discussed further in the Implications section.

Additionally in my mediation testing, I found the direct effect of cognitive CQ on behavioral CQ was statistically significant in all five models, meaning each model only partially mediated the relation between cognitive and behavioral CQ. These findings show that cognitive CQ does affect the development of behavioral CQ, but that effect is strengthened by motivational and metacognitive CQ in causal serial relationships, in parallel, and individually. This further supports Rockstuhl and Van Dyne's (2018) findings regarding the importance of metacognitive and motivational CQ. I also further supported Rockstuhl and Van Dyne's results by demonstrating that metacognitive CQ was a significant mediator by itself, in parallel with motivational CQ, and in a causal series with motivational CQ. Metacognitive CQ, like motivational CQ, also plays a significant role in explaining the relation between cognitive and behavioral CQ. These relations provide information regarding how CQ domains influence and relate to one

another as recommended by Gooden et al. (2017). Quantitatively detailing these interactions, I furthered the development of multiple intelligences theory and the CQ nomological network (Davidson & Downing, 2006; Gardner, 2013; Rockstuhl & Van Dyne, 2018).

Other relations I tested for included moderation and moderated moderation. In Research Question 6, I focused on moderated moderation and asked to what extent motivational CQ moderates the moderation of cognitive CQ's effect on behavioral CQ by metacognitive CQ. I also tested the moderation of the path cognitive CQ to behavioral CQ by motivational and metacognitive CQ. By testing for moderation, I built on Rockstuhl and Van Dyne's (2018) meta-analysis in which they argued that metacognitive CQ had moderating effects that reflected the dimension's importance in the development of CQ beyond cognition. Additionally, I extended the work of Awan et al. (2018b), who found that metacognitive CQ and, separately, motivational CQ moderated the relation between contract governance (a type of cognition) and collaboration (a type of behavior).

Testing research questions seven and eight, I tested whether metacognitive and motivational CQ moderated the relation between cognitive and behavioral CQ respectively. In research question nine, I examined whether motivational CQ moderated the path from metacognitive to behavioral CQ. I used Hayes's (2018) PROCESS macro for IBM SPSS to test all four moderation models. When I tested moderated moderation and single moderation models, none of the models showed significant moderation, with the bootstrap confidence interval for all but one of the interaction effects including 0.

When testing for moderated moderation (RQ6), the interaction Cognitive*Motivational had a confidence interval that did not include 0, indicating nominal significance at $p < .05$ ($p = .0289$). However, in the model for research question eight, this same interaction effect was not significant because the bootstrap confidence interval included 0 and $p > .05$ ($p=.4012$). Because research question eight uses a model with fewer terms, it would be expected that the interaction Cognitive*Motivational would be significant in research question eight if the result from research question six was not artifactual (Hayes, 2018). Testing research question seven, I did not find moderation of the path from cognitive to behavioral CQ by metacognitive CQ. Testing research question nine, I did not find moderation in the path from metacognitive to behavioral CQ by motivational CQ. I did not find any moderated relations, but it is important to note that I did not test all possible relations between the factors for moderation as discussed more fully in the next section.

Limitations

Even though research into the relations between dimensions is still nascent, I was unable to explore every possible combination of interactions (Gooden et al., 2017; Hayes, 2018). Hayes (2018) explained that no researcher can examine all relations between phenomena. I did not test whether cognitive or behavioral CQ act as mediators or moderators in the relations between other dimensions. Korzilius et al. (2019) found that all four dimensions of CQ mediated the relation between multiculturalism and innovative work behavior, demonstrating that cognitive and behavioral CQ can act as mediators. Dogra and Dixit (2019) also found that cognitive and behavioral CQ have mediating

properties. Specifically, the authors found that cognitive CQ has a positive mediating effect on the direct relation between task conflict and innovation and behavioral CQ has a positive mediating effect on the direct relations between four types of conflict (task, relationship, process, and status) and innovation. I did not test the mediating properties of cognitive and behavioral CQ because Racicot and Ferry (2016) suggested motivational and metacognitive CQ. In the literature I reviewed there were no direct calls to test the meditating properties of cognitive and behavioral CQ.

I also did not test the moderating properties of cognitive and behavioral CQ. Şahin and Gürbüz (2017) found that cognitive, metacognitive, and motivational CQ all had mediating properties. Additionally, Caputo et al. (2018) found all four factors of CQ moderated relations between cultural orientations and conflict-management style. Although the research I reviewed demonstrated that cognitive and behavioral CQ had moderating properties, the research on interrelations between the factors focused on behavioral CQ as an output variable (Gooden et al., 2017). In my research, I also did not look beyond the relations among dimensions because these have been well studied (Fang et al., 2018). Another limitation is the fact that I conducted my research online via the SurveyMonkey platform.

I conducted my research via the SurveyMonkey platform because of my lack of university and corporate contacts as well as the fact that I live in an area of Japan with limited English-speaking social contacts, which would have made it difficult to find participants in person. Additionally, it would have been quite expensive for me to travel to a country or area with a larger English-speaking population. By using the

SurveyMonkey platform, I lowered the cost and time necessary to distribute and collect surveys without limiting generalizability because participants came from nine different regions in the US creating geographic diversity (Rice et al., 2017). This will be discussed further in the next section on recommendations.

Recommendations

Future researchers should use populations that live outside of the United States and come from different regions of the world to ensure that the work is globally generalizable (Rice et al., 2017). Another area for future research is exploring behavioral CQ as something other than the output variable as in all of my tests. As stated in Rockstuhl and Van Dyne (2018), behavioral CQ is important in an individual's ability to develop intercultural effectiveness. Gooden et al. (2017) argued that all four dimensions should be investigated for their individual capabilities as does Ang et al. (2007). My research built on what Gooden et al. began by studying more than simple and direct relations, however because behavioral CQ was the output variable in all my models, I did not explore this dimension's capabilities as a mediator or moderator in relations between factors. I also did not explore whether cognitive CQ acts as a mediator or moderator. I recommend that future researchers examine whether cognitive and behavioral CQ have mediating and moderating relations with other factors as supported by the work of. Korzilius et al. (2017), Dogra and Dixit (2019), Şahin and Gürbüz (2017), and Caputo et al. (2018), who found that cognitive and behavioral CQ can have moderating and mediating effects on relations between phenomena.

Further exploration of the relations among CQ dimensions will provide information regarding the individual capabilities of each individual dimension as called for by Gooden et al. (2017) and Ang et al. (2007). I began this exploration in my research. My research along with future research into the capabilities of individual factors and how the interrelations between factors impact the develop of CQ will provide significant information regarding how CQ forms and improves to those developing training (Rockstuhl & Van Dyne, 2018). Based on my findings, I recommend that researchers and managers who are in the field of developing CQ training test whether CQ training designed to raise dimension in a sequential manner has longer lasting effects across setting and populations.

Implications

Developing effective training across populations and settings for CQ contributes to the social good because of CQ's relationship with knowledge sharing (Kwantes & Glazer, 2017; de Castro et al., 2020). Knowledge sharing has global lifesaving and financial repercussions (Golestaneh et al., 2020; Nathavitharana et al., 2020). Failure to knowledge cost corporate revenue losses estimated at $31.6 billion annually globally and at $2 billion annually for the United States (Jecker et al., 2021; Vlajčić et al., 2019; Kwantes & Glazer, 2017). During the global pandemic, failure to knowledge share resulted in multiple waves of infection and increased death rates that were later exacerbated by the uneven distribution of vaccines (Golestaneh et al., 2020; Jecker et al., 2021; Nathavitharana et al., 2020). This lack of knowledge sharing is evidence that current CQ training methods are not raising CQ in manner that reduces failure to

knowledge share in business, medical, and personal dynamics (; Hani et al., 2020; Stoermer et al., 2021Young et al., 2017a). This is evident because global policies and laws are culture-based as are biases and preferences, including choices regarding the sharing of knowledge (Roux & Suzuki, 2017; Nath, 2020). CQ improves knowledge sharing by reducing culture-based bias, saving lives and money **(**Earley & Ang, 2003; Jecker et al., 2021; Vlajčić et al., 2019).

In addition to the construct being socially significant, so is my research because it provides information regarding how CQ develops (Ang et al., 20017). My results provide information on the development of behavioral CQ that researchers in the field of CQ training can use to inform the development of new training approaches that result in long-term real-world improvement of CQ levels (Rockstuhl & Van Dyne, 2018). Like Rockstuhl and Van Dyne's (2018) work, my research demonstrated the importance of motivational and metacognitive CQ. This supports the argument for the inclusion of motivational CQ as its own domain while also supporting the work of Rockstuhl and Van Dyne who argued for the importance of motivational CQ. My research also has practical implications and supports the authors' call for a more blended approach to CQ training. Specifically, it supports blended approaches such as including lectures, large group discussions, and experiential training focused on raising motivational and metacognitive CQ in tandem with cognitive and behavioral CQ. My research demonstrated that motivational and metacognitive CQ work in a causal relationship in the path from cognitive to behavioral CQ (Charalambous, 2019). This is both socially significant and practically significant because it provides a new avenue of exploration for those who

develop training to explore and may answer why current training is not creating long-term real-world effects (Azevedo & Shane, 2019; Earley & Ang, 2003).

Adding to how my findings will impact researchers in the field of CQ, I demonstrated that there are complex interrelations between the factors, addressing the call by Ang et al. (2007) and Gooden et al. (2017) for such research and providing empirical support for further exploration of the individual properties of each factor. This is especially true when considering the exploration of cognitive and behavior CQ's ability to act as meditators and moderators (Caputo et al., 2018; Dogra & Dixit, 2019; Korzilius et al., 2017; Şahin & Gürbüz, 2017;). As noted throughout this dissertation, behavioral CQ was the output variable for my models and cognitive CQ was the input variable in all but one of my tests. My research provides empirical support for testing of other relations to further the explore how CQ develops (Ang et al., 2007). With my finding I also provide empirical support for Earley and Ang's (2003) CQ theory.

The biggest criticism of Earley and Ang's (2003) CQ theory is the inclusion of motivation as a unique intelligence dimension (Liao & Thomas, 2020a). With my findings, I provide empirical support for the importance of motivational CQ in the path from cognitive to behavioral CQ (Charalambous, 2019). My work also supports Hanto and Inagaki's (2017) argument that motivation plays a key role in the cognitive process of developing conceptual and procedural knowledge by demonstrating that motivational CQ has a causal sequential relation with metacognitive CQ in the path from cognitive to behavioral CQ (Hayes, 2018). This matches Earley and Ang's argument that the drive

motivational CQ creates is integral to the development of conceptual (metacognitive CQ) and expertise displays in cultural adaption (behavioral CQ).

I further support the development of CQ theory by demonstrating that there are serial, parallel, and moderating relations in the path from cognitive to behavioral CQ by motivational and metacognitive CQ, as called for by Rockstuhl and Van Dyne (2018). I demonstrated that there is not strong evidence for a moderating or moderated moderation relation in the path from cognitive to behavioral CQ by motivational and/or metacognitive CQ. In addition to also demonstrating that the path from metacognitive to behavioral CQ is probably not moderated by motivational CQ, my findings on moderation provide more insights to the individual properties of motivational and metacognitive CQ as called for by Gooden et al. (2017). My research provides empirical evidence of some of the interrelations that exist, and do not seem to exist, between dimensions and builds on the nomological network that already exist for the construct (Ang et al., 2007). I have demonstrated that my research is socially significant while expanding the CQ nomological network and supporting multiple intelligence theory (Davidson & Downing, 2006; Ealey & Ang, 2007; Liao & Thomas, 2020a,).

Conclusion

In my research, I expanded multiple intelligences theory by providing further support for Gardner's (2013) as well as Earley and Ang's (2003) theory of interactive autonomous culture-based intelligences. My exploration of the interaction between the four autonomous dimensions of CQ provided information on how the different forms of intelligence relate and interact as called for by Davidson and Downing (2006). My

research built on the work of Gooden et al. (2017), Ang et al. (2007), and Rockstuhl and Van Dyne (2018), taking what those authors suggested as the next step in CQ research by investigating interactions among the four dimensions of CQ. Improving CQ is a global imperative and of the utmost social significance because of the constructs relation with knowledge sharing a lifesaving behavior as well as the best avenue to reversing the greatest global depression since World War II (Golestaneh et al., 2020; Nathavitharana et al., 2020; Vlajčić et al., 2019;).

The global pandemic and loss of lives due to a failure to knowledge share and low CQ reflect the urgency for developing CQ training that results in real-world long-term increases (Jecker et al., 2021; Sharma, 2019). Improved knowledge sharing would result in the equitable distribution of personal protective equipment, vaccines, ventilator, and information about communicable disease such as COVID-19 (Nathavitharana et al., 2020). This is because global policies and laws are culture based as are biases and preferences that govern knowledge sharing (Roux & Suzuki, 2017). In addition to these lifesaving effects, improved knowledge sharing would reduce corporate revenue losses estimated at $31.6 billion annually globally and at $2 billion annually for the United States (Jecker et al., 2021; Kwantes & Glazer, 2017; Vlajčić et al., 2019;). This makes improving CQ and knowledge sharing globally important in addition to the socially positive outcomes of reduce cultural bias (Ang, et al. 2007).

With my findings, I provide empirical support for the next steps in CQ training development as well as the next steps in CQ research (Hayes, 2018). Training developers should follow the guidelines set by Rockstuhl and Van Dyne (2018) and focus on training

that incorporates blended approaches that include lectures, large groups discussions, and experiential training focused on raising motivational and metacognitive CQ in tandem with cognitive and behavioral CQ. My research reflects that starting with methods that develop cognitive CQ and then focusing on motivational, then metacognitive CQ will result in behavioral CQ (Charalambous, 2019). This is because of the causal and sequential relationship motivational and metacognitive CQ in the path from cognitive to behavioral CQ (Hayes, 2018). Further research into the individual domains is warranted because of the ability of CQ to improve our lives and society (Ang et al., 2007; Roux & Suzuki, 2017; Young et al., 2017a).

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Appendix A: Figures

Figure A1

Serial Mediation Model for Research Question 1

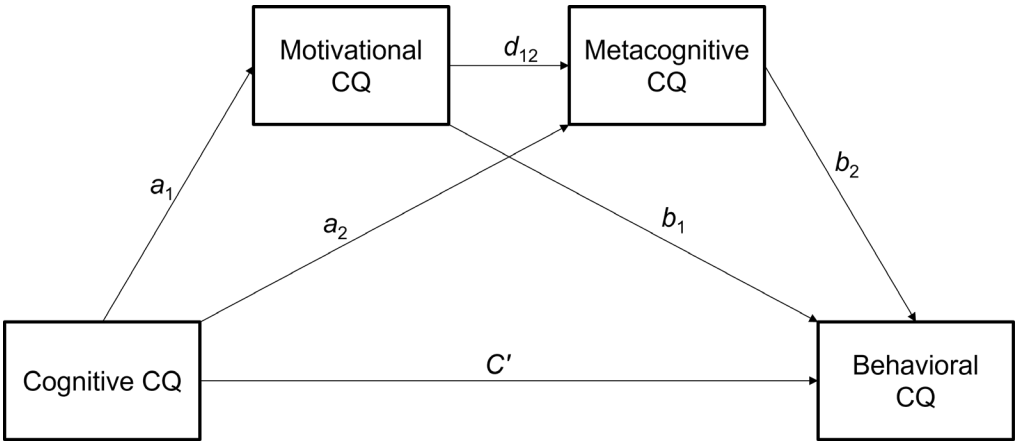


Figure A2

Parallel Mediation Model for Research Question 2

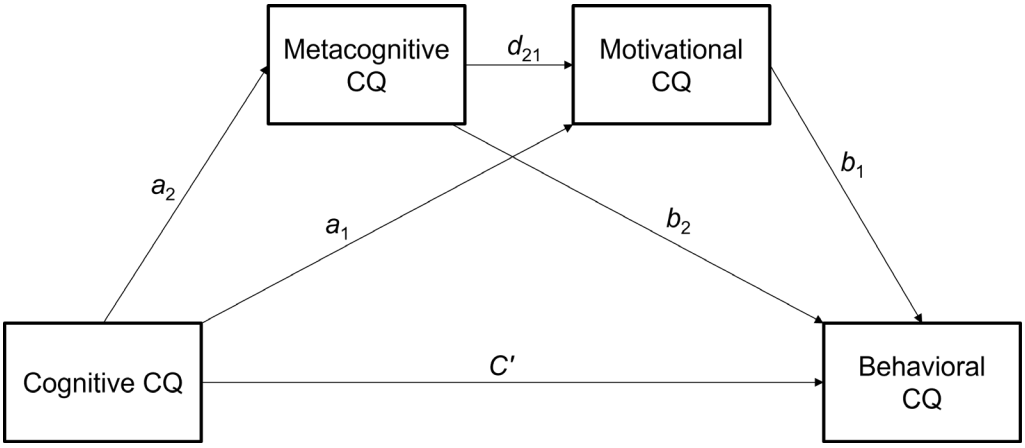


Figure A3

Parallel Mediation for Research Question 3

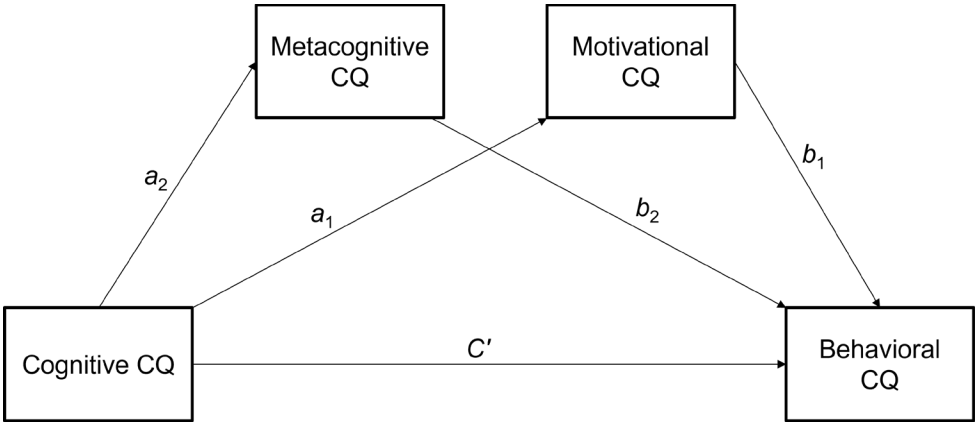


Figure A4

Mediation Model for Research Question 4

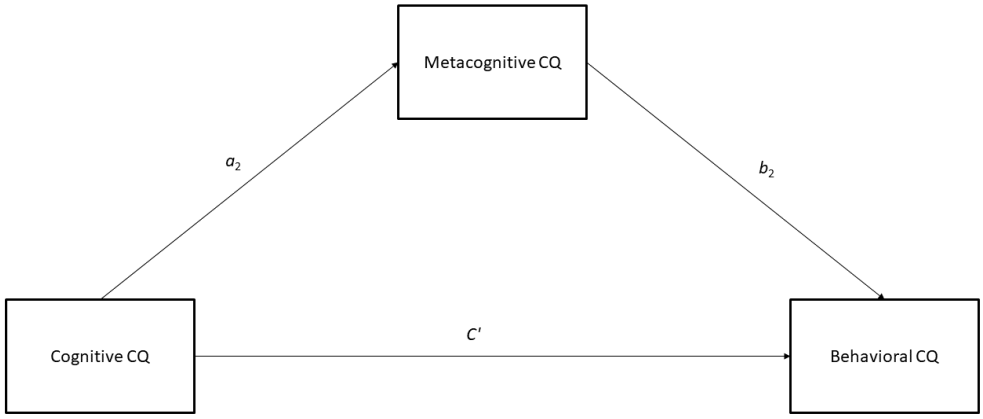


Figure A5

Mediation Model for Research Question 5

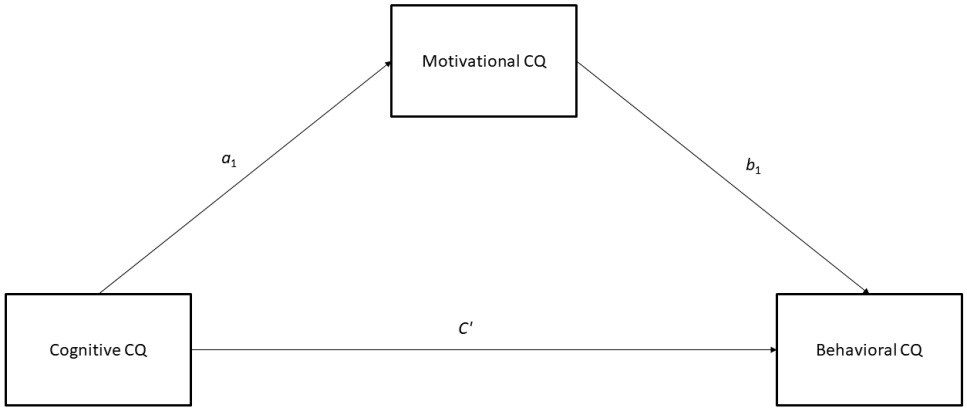


Figure A6

Moderated Moderation Model for Research Question 6

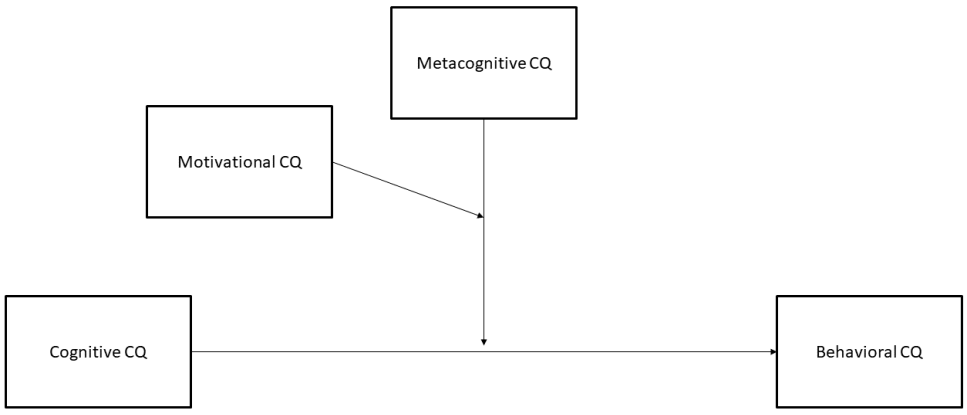


Figure A7

Simple Moderation for Research Question 7

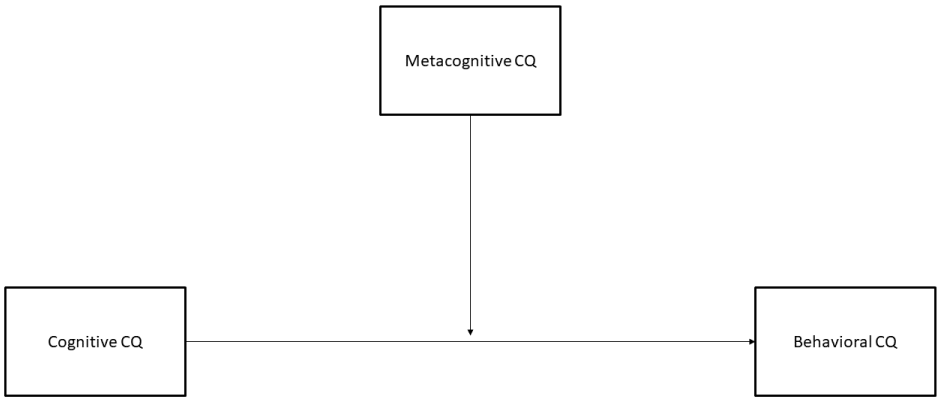


Figure A8

Simple Moderation for Research Question 8

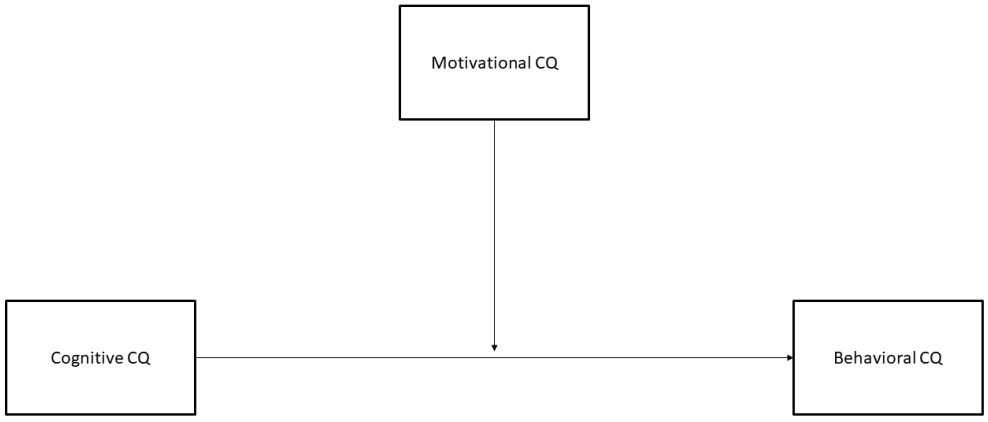


Figure A9

Simple Moderation for Research Question 9

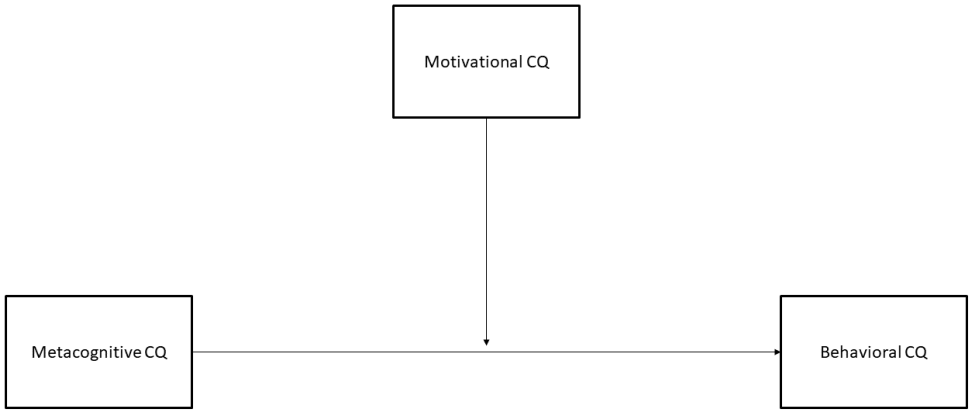


Figure A10

Partial Residual Plot for Behavioral CQ

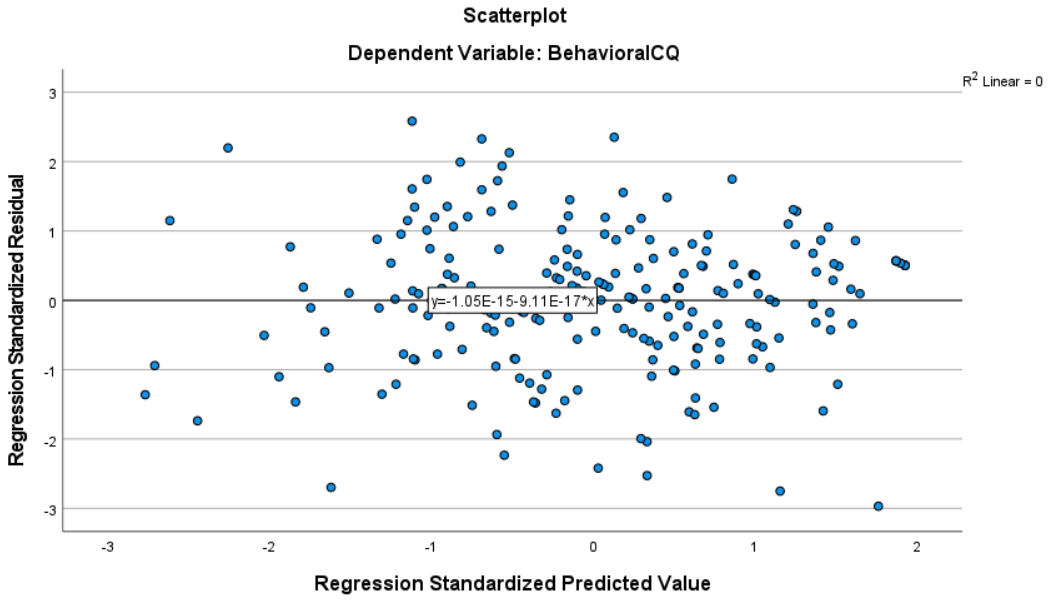


Figure A11

Partial Regression Plot of Metacognitive CQ Versus Behavioral CQ

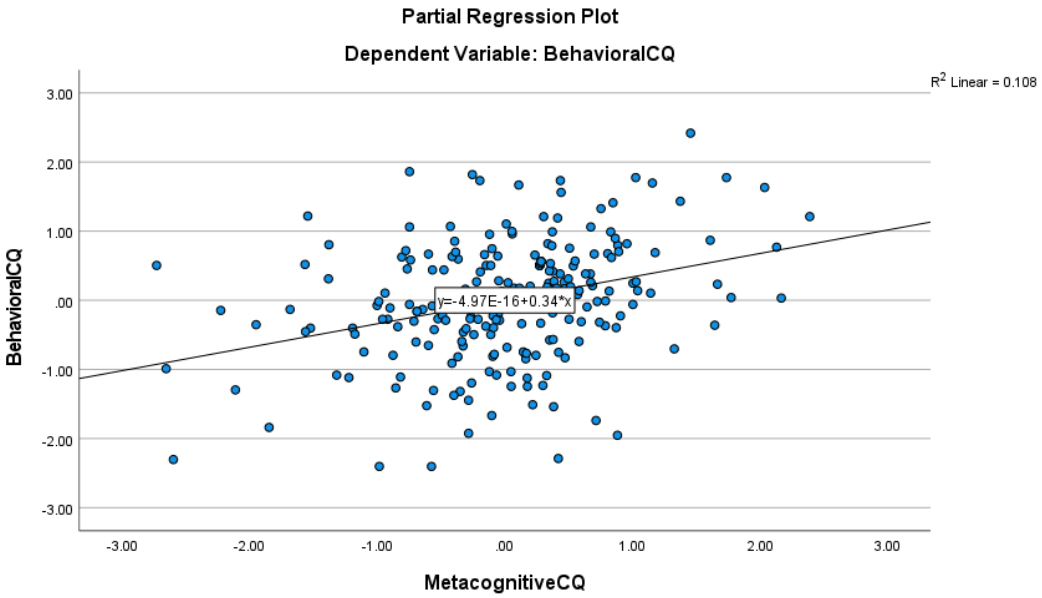


Figure A12

Partial Regression Plot of Cognitive CQ Versus Behavioral CQ

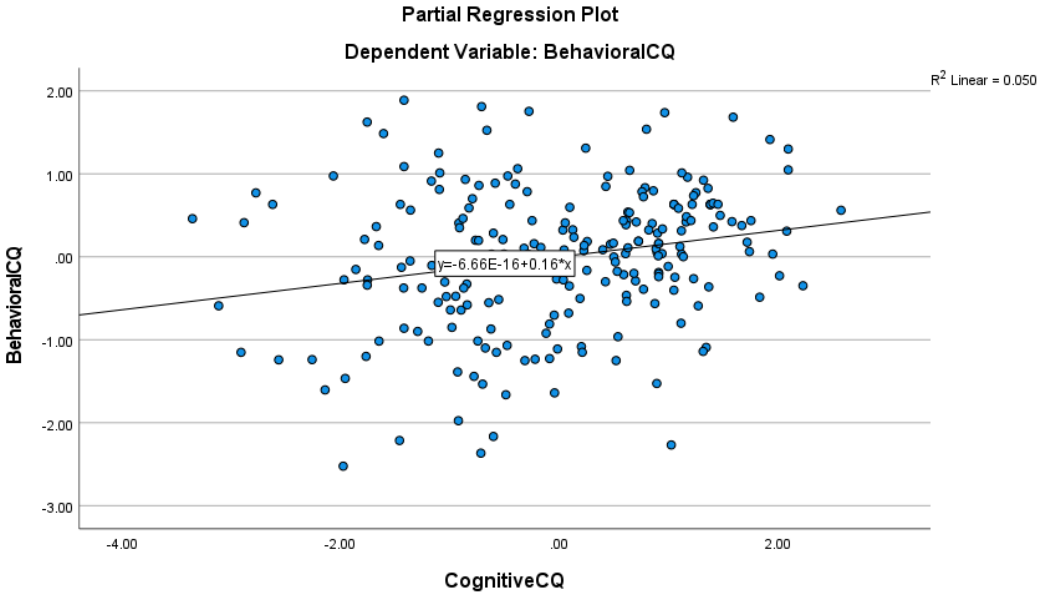


Figure A13

Partial Regression Plot of Motivational CQ Versus Behavioral CQ

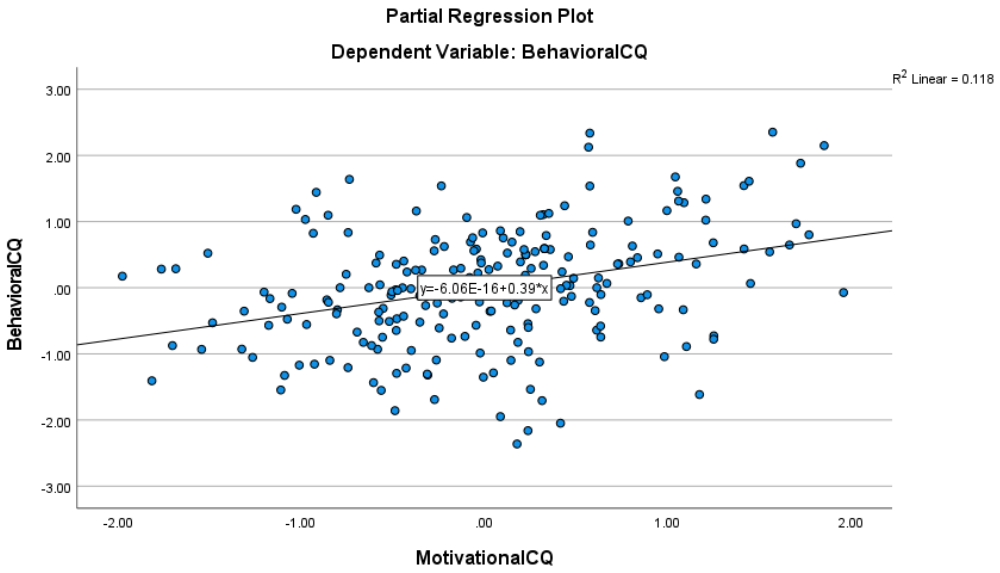


Figure A14

Serial mediation model of cognitive, motivational, and metacognitive CQs on behavioral CQ, showing the path for research question 1

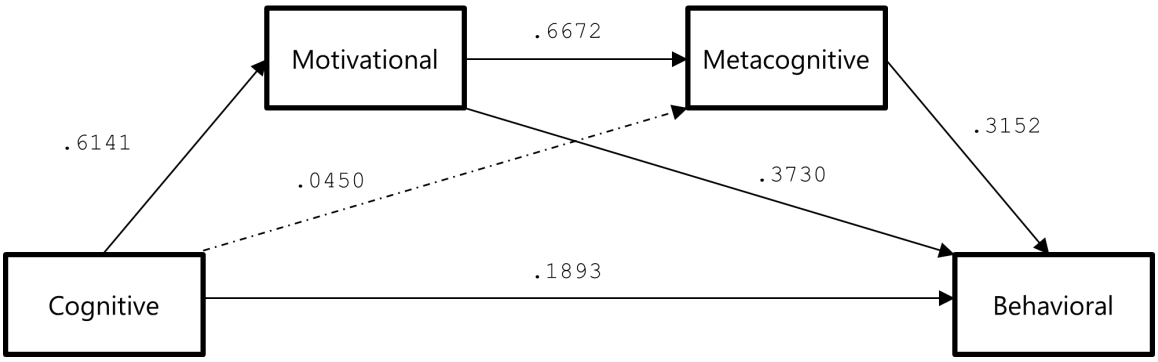


Figure A15

Serial mediation model of cognitive, metacognitive, and motivational CQs on behavioral CQ, showing the path for research question 2.

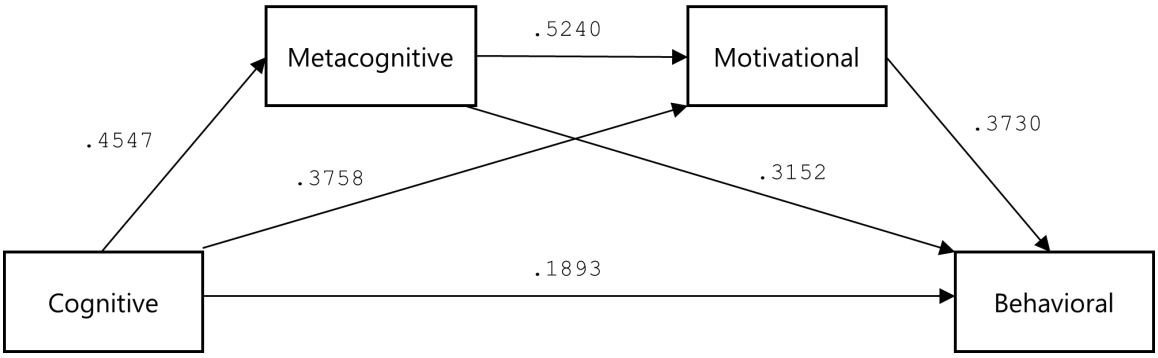


Figure A16

Parallel mediation of cognitive, metacognitive, motivational, and behavioral CQ, showing research question 3.

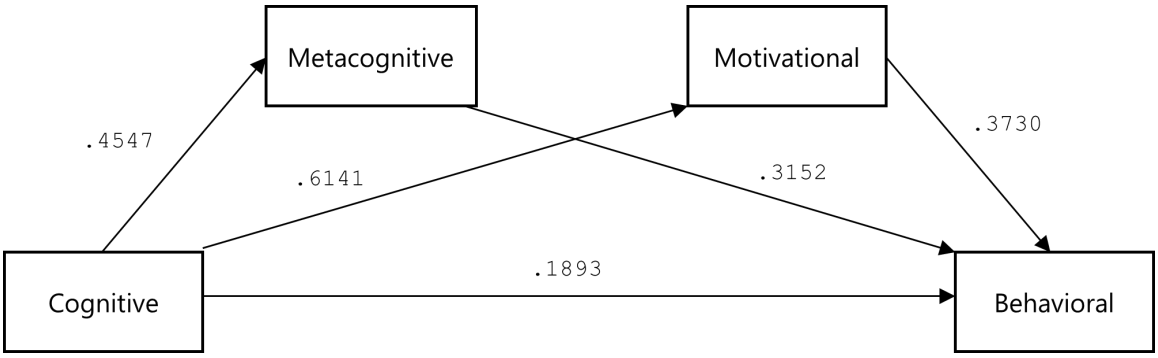


Figure A17

Mediation model of cognitive, metacognitive, and behavioral CQ, showing the path for research question 4

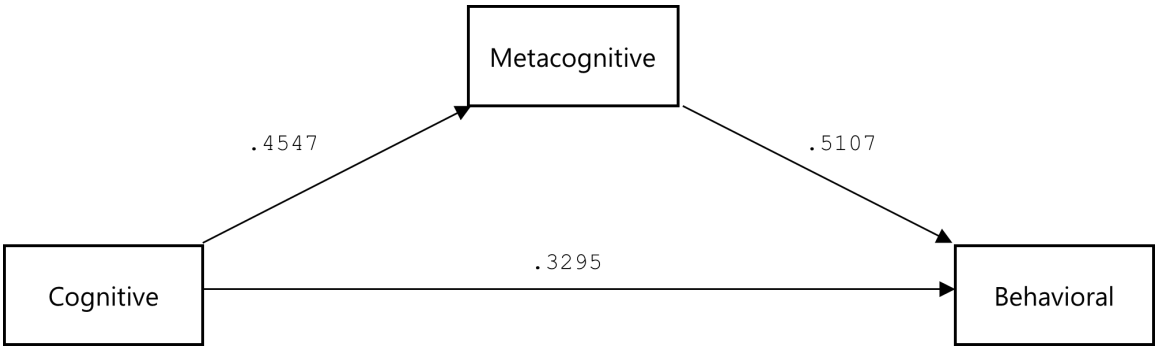
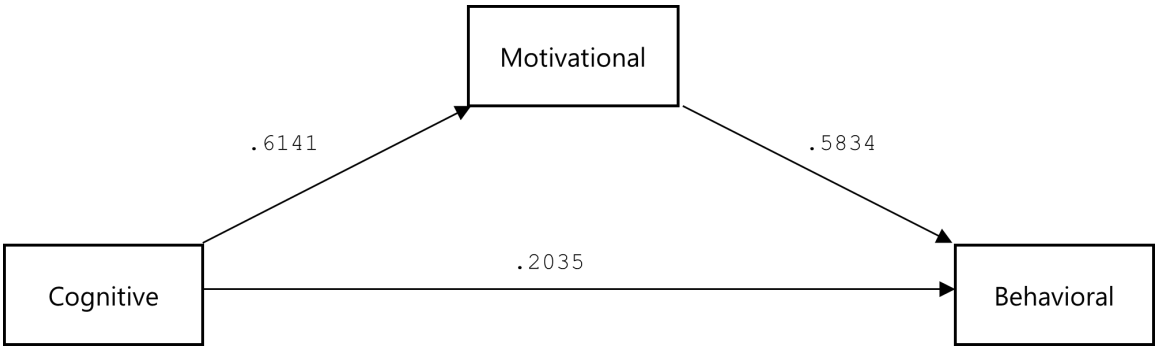


Figure A18

Mediation model of cognitive, motivation, and behavioral CQ, showing the path for research question 5.



Appendix B: Permission to Use the Cultural Intelligence Scale

Copyright Cultural intelligence Center 2005. Used by permission. Use of this scale is granted to academic researchers for research purposes only. Ang and Van Dyne (2015, p. 20) give permission to use the Cultural Intelligence Scale for academic research: “Use of this scale is granted to academic researchers for academic purposes only.”

Appendix C: Participation Invitation Letter

Dear Invitee,

My name is Kisstopher Musick. I am a doctoral student at Walden University's General Psychology Program. I am kindly requesting your participation in a doctoral research study that I am conducting titled "The Relations Among Cultural Intelligence Dimensions in Adult SurveyMonkey Audience Members". The purpose of this study is to test whether the four dimensions of cultural intelligence interact. The study involves completing basic demographic information that is limited to age, type of high school attended, that you identify as an English speaker, and to confirm that you currently live in the United States, as well as one survey: The Cultural Intelligence Scale (Van Dyne, Ang, and Koh, 2015).

Participation is completely voluntary, and you may withdraw from the study at any time with no penalty. The study is completely anonymous; therefore, it does not require you to provide your name or any other identifying information; demographic information is requested only to verify eligibility. If you would like to participate in the study, please read the consent letter below. To begin the study, click the survey link at the end. Your participation in the study will be of great importance to assist in social change by adding information about how cultural indigence develops.

Thank you for your time and consideration.

Sincerely,

Kisstopher Musick

MS, Doctoral Student, Walden University

Appendix D: Informed Consent

CONSENT FORM

You are invited to take part in a research study about your knowledge of other cultures.

This form is part of a process called "informed consent" to allow you to understand this study

before deciding whether to take part.

This study seeks 224 volunteers who are:

- Who are 18 years or older
- Live in the United States at the time of taking the survey regardless of citizenship status
- Attended an accredited High school program and was not homeschooled

This study is being conducted by a researcher named Kisstopher Musick, who is a doctoral student at Walden University.

Study Purpose:
The purpose of this study is to test if elements of cultural intelligence interact.

Procedures:
This study will involve you completing the following steps:

- Complete an online survey that will take approximately 15 minutes

Here are some sample questions:
I enjoy interacting with people from different cultures.
I am confident that I can socialize with locals in a culture that is unfamiliar to me.
I alter my facial expressions when a cross-cultural interaction requires it.

Voluntary Nature of the Study:
Research should only be done with those who freely volunteer. So everyone involved will respect your decision to join or not.
If you decide to join the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:
Being in this study could involve some risk of the minor discomforts that can be encountered in daily life such as sharing sensitive information. With the protections in place, this study would pose minimal risk to your wellbeing.

It is not expected that you will experience any distress from taking this survey; however if you do please reach out to Mental Health America a free 24 hour support line with trained crisis support volunteers who can be reached via text MHA to 741741 or by phone 1-800-273-TALK (8255).

This study offers no direct benefits to individual volunteers. The aim of this study is to benefit society by adding information about cultural intelligence develops. Once the analysis is complete, the researcher will share the overall results by creating a results dashboard on the survey monkey platform and posting a 1 to 2 page summary of my results.

Payment: None

Privacy:
The researcher is required to protect your privacy. Your identity will be kept anonymous, within the limits of the law. The researcher Kisstopher Musick. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. If the researcher were to share this dataset with another researcher in the future, the dataset would contain no identifiers so this would not involve another round of obtaining informed consent. Data will be kept secure by a SPSS encrypted at rest data page in the cloud. Data will be kept for a period of at least 5 years, as required by the university.

Please click **Next** to continue reading informed consent.

Contacts and Questions:
You can ask questions of the researcher by email Kisstopher.musick@waldenu.edu. If you want to talk privately about your rights as a participant or any negative parts of the study, you can call Walden University's Research Participant Advocate at 612-312-1210. Walden University's approval number for this study is **11-24-21-0241731**. It expires on **November 23, 2022.**

You might wish to retain this consent form for your records. You may ask the researcher or Walden University for a copy at any time using the contact info above.

Obtaining Your Consent

If you feel you understand the study and wish to volunteer, please indicate your consent by **clicking next**.